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ABSTRACT

The structure and perceived benefits of the cooperative education programs offered by two-year colleges in Cincinnati, Ohio, were examined in a study in which 66 representatives of 54 area firms and 25 individuals from 7 community colleges were interviewed in 1993. Cincinnati's co-op programs were found to vary significantly in their structure. Some programs alternated 10-week periods of schooling with similar periods of work, whereas others offered schooling in the morning followed by work in the afternoon. In some colleges, administration of co-op programs was decentralized. Although the benefits of co-op programs could not be quantified, the educators and employers interviewed were virtually unanimous in their support for co-op education's benefits for students, employers, and relationships between colleges and employers. Despite the nearly unanimous support, several problems with the program were identified: problems in recruiting enough co-op placements and the substantial differences between the training opportunities offered at firms where employers viewed co-op as a way of "growing their own employees" and those at firms where employers used co-op primarily as a source of short-term, well-trained labor and kept students in a single position. (Thirty-three references are listed. Appended are the employer and education provider interview guides.) (MN)

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National Center for Research in
Vocational Education

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INDIGENOUS SCHOOL-TO-WORK PROGRAMS: LESSONS FROM CINCINNATI'S CO-OP EDUCATION

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INDIGENOUS SCHOOL-TO-WORK PROGRAMS: LESSONS FROM CINCINNATI'S CO-OP EDUCATION

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This research originated in a study of four local labor markets, in which we happened to choose Cincinnati as an example of a labor market with considerable manufacturing. Torry Dickinson, Lorraine Giordano, and Gail Kaplan ably carried out an early round of interviews in Cincinnati, and served as co-authors of a report based on that research (Grubb, Dickinson, Giordano, & Kaplan, 1992). Many of their insights and perspectives have informed the analysis in this monograph as well.

EXECUTIVE SUMMARY

Interest in school-to-work programs combining school-based learning and work-based learning has expanded substantially in the past few years, particularly because of the passage of the School-to-Work Opportunities Act of 1994. However, there are relatively few examples of school-to-work programs in this country from which individuals attempting to develop new programs might learn; many of the recent experimental efforts are too new or too special to provide much guidance. This monograph describes a naturally occurring "experiment" in work-based learning that is quite long-lived and widespread: the cooperative education programs that take place in the two-year colleges of the Cincinnati area. For special historical reasons, co-op was first established in that region and has persisted. Every two-year college in the area offers co-op, and a large number of employers hire co-op students. The results provide a variety of lessons for others attempting to develop school-to-work programs.

The Structure of Cooperative Education

Co-op programs in Cincinnati vary substantially in their structure. Some alternate 10-week periods of schooling with similar periods of work, while others offer schooling in the morning followed by work in the afternoon. In some colleges, the administration of co-op is decentralized, allowing co-op coordinators to specialize in certain sectors, while in others administration is centralized. Some employers—particularly those who use co-op to "grow their own" employees, and who take a particularly educational attitude toward co-op—rotate their co-op students through different positions, and provide seminars and other activities to allow them to understand "all phases of the business." Others—particularly those who use co-op as a source of low-cost, well-trained labor—tend to place students in a single position. Each of these ways of structuring co-ops has its advantages, though there are reasons to think that decentralized administration, alternating periods of time, and rotation through several positions lead to higher-quality placements.

Co-ops may be initiated by the college, the employers, or by the student, with great variation in the wages paid and in the college credit given. A crucial aspect is the selection of students: in general, the colleges have screening criteria related to academic preparation, while employers screen students on the basis of criteria that they apply to their regular

employees—sometimes relying heavily on the colleges to make recommendations. In general, employers are more interested in personal competencies—enthusiasm, the ability to work with others, dependability—than they are in either job-specific skills or in conventional academic criteria like grades. The result of such screening is a "high-quality equilibrium," in which colleges provide well-prepared students while employers provide high-quality placements—and if either side violates this informal but well-understood agreement, the quality of the co-op program is likely to fall.

The Benefits of Cooperative Education

Although the lack of good data makes it impossible to quantify the benefits of cooperative education, educators and employers in Cincinnati are virtually unanimous in their support for the benefits of co-op—for students, for employers, and for the relationships between colleges and employers. For students, the benefits include gaining direct knowledge about the workplace and the applications of school-based learning in the workplace. Co-op placements also help students learn about what kinds of occupations they like and dislike, and—because a large number of employers hire their co-op students—they provide a mechanism of direct entry into the labor market. Additionally, the earnings from co-op placements help many students remain in school.

For employers, one principal benefit is the ability to "grow their own" employees—to generate training programs that provide precisely the mix of cognitive, personal, and job-specific skills that they require. Others stressed that co-op placements make excellent screening mechanisms because they allow employers to see the range of capacities—including personal attributes like initiative, the ability to work in groups, and discipline—that are poorly measured except by direct observation on the job. Many employers also cited co-op students as a source of cost-effective labor, a perspective considerably different from the longer-run perspective of employers trying to "grow their own" employees.

For the colleges involved, the principal benefit of co-op education is that it strengthens their institutional links to employers. In Cincinnati, employers are quite familiar with the variety of education providers, and generally supportive of education—in contrast to other communities where their attitudes range from indifference to hostility. Colleges also benefit from having what they consider to be higher-quality education,

guided by the participation of employers and complemented by work-based placements, and they also enjoy higher placement rates for their graduates than would be true in the absence of co-op education.

The benefits of co-op are especially powerful given some special characteristics of sub-baccalaureate labor markets in which community colleges operate. This segment of the labor market is quite local—so that local employment related to a student's field of study is crucial to realizing economic benefits. Co-op education strengthens the relationships between colleges and employers and leads directly to higher placement rates, partly addressing the problems that arise in other local labor markets where educational institutions and employers are distant from one another. In addition, hiring in the sub-baccalaureate labor market usually requires experience, which is a good indicator of job-specific skills and certain personal capacities; this makes it difficult for students without experience to break into employment. Since co-op programs provide experience and allow employers to judge the competence of their co-op students directly, they facilitate entry into sub-baccalaureate employment.

However, we stress that the lack of data about co-op programs limits our ability to draw conclusions about their effectiveness. All statements about effectiveness are statements of employers, educators, and students about their experiences, and—powerful though this kind of testimony can be—it is not a substitute for the kind of quantitative information that is lacking.

The Implication of Cincinnati Co-op for School-to-Work Programs

The experiences of Cincinnati educators and employers confirm once again what the proponents of work-based and co-op education have claimed about the benefits of work placements. They also clarify that support from employers can be quite powerful, since in Cincinnati there is no doubt among employers that hiring co-op students is worthwhile. However, there remain problems in recruiting enough co-op placements, even in such a supportive community. In addition, there is a substantial difference between the two approaches to co-op among employers. Those who see them as a way of "growing their own" employees for the long run tend to take a more educative view, and to provide a

variety of placements and supportive activities. In contrast, those who see co-op predominantly as a source of low-cost labor may offer less interesting placements.

A second implication for school-to-work programs involves the importance of the "high-quality equilibrium" in Cincinnati, where colleges screen students for academic abilities and personal attributes while employers try to offer high-quality placements. This outcome is clearly important to the maintenance of co-op education over time because employers and students alike would quickly abandon low-quality programs. In Cincinnati, this equilibrium is achieved through clear expectations among employers and educators, established in face-to-face contact and constant discussion—not through skill standards, certificates of mastery, complex written agreements, or other formal regulatory mechanisms. This suggests that such devices, often thought crucial to school-to-work programs, may not be necessary or desirable.

Several factors are important to institutionalizing the work-based programs in Cincinnati, however. One is state financial support through the regular program of financing community colleges. The other is the support of co-op coordinators in community colleges, who are the linchpins of successful programs. The absence of formal regulatory mechanisms and bureaucratic authority in the Cincinnati co-op programs, while surprising, also suggests that a peculiarly American form of work-based learning has developed, embedded in voluntary relations and expectations rather than rules and regulations (as in the German apprenticeship system). The implication is that the development of a culture of expectations around work-based learning—including expectations among employers that co-op education is worthwhile—may be more powerful in the long run to sustaining work-based learning than are more formal mechanisms of institutionalization. Under these conditions, a unique form of school-to-work program has evolved in Cincinnati—and by implication can develop elsewhere.

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INTRODUCTION:
WORK-BASED LEARNING AND COOPERATIVE EDUCATION

A basic ambiguity has confronted those responsible for preparing the workforce: Is the training of workers best accomplished on the job, or in education and training institutions set apart from workplaces? Historically, of course, apprenticeships—including the unconscious and informal "apprenticeships" of learning at a father's side or a mother's knee—were the dominant form of preparation. But in this country, disaffection with apprenticeships grew throughout the eighteenth and nineteenth centuries. The range of skills taught was all too often narrow and intensely occupation-specific; the Industrial Revolution tended to divest apprenticeship of its educational functions, replacing the father-son relation of earlier craft apprenticeships with an employer-employee (or boss-worker) relationship stripped of its moral and educational content (Douglas, 1921). At the turn of this century, school-based preparation for occupations grew substantially in the form of professional education in colleges preparing students to become engineers, doctors, lawyers, and academics, and vocational education in high schools, preparing workers for craft jobs and other moderately skilled positions. These developments were testimony in part to the need for more general or "academic" forms of education only awkwardly learned at work, and in part to the disappearance of apprenticeship training.

But even though school-based forms of work preparation have dominated ever since, there have been equally serious doubts about its appropriateness. Indeed, federal support for vocational education—heavily influenced by the German apprenticeship system—was initially envisioned as a way of combining school-based and work-based preparation: Individuals starting work would continue their formal schooling in "continuation schools" that they would attend after the work day. Vocational education did not develop in that direction, of course, but co-op education did develop and lived on, albeit in small numbers. Periodically, educational reformers would decry the distance between school and work, school and community, school and politics, and propose mechanisms to narrow this gap. Indeed, this notion was most recently promoted just twenty years ago, when the rediscovery of the "irrelevance" of schooling generated a barrage of commission reports, and calls for early graduation and work experience programs as better ways of preparing students for their future roles (Grubb, 1989; Timpane, Abramowitz, Bobrow, & Pascal, 1976).

And the cycle has turned yet again. We are now in the midst of great enthusiasm for work-based learning, incited in part by a continued infatuation with the German apprenticeship system (e.g., Hamilton, 1990) and in part by a new realization that many of the skills required at work—and especially for high-productivity work—cannot be well taught in schools. According to the reports of the Secretary's Commission on Achieving Necessary Skills (SCANS) (1991), for example, the high-skill workplace now requires not only "foundation skills"—basic academic skills including reading, writing, math, listening, and speaking—but also thinking skills (such as decision-making, problem-solving, knowing how to learn, as well as personal qualities such as responsibility, sociability, self-management, integrity, and honesty. But many of these "thinking skills" and behavioral traits can only be taught in an appropriate context; and since schools can only mimic the conditions of work and not precisely replicate them, it has seemed natural to call for work-based learning as the solution. For example, the William T. Grant Foundation Commission on Work, Family, and Citizenship (1988), siding with the "forgotten half" poorly served by the conventional academic curriculum, argued for a mix of "abstract" and experiential learning:

> These experience-based educational mechanisms offer some of the most exciting opportunities available anywhere in America for sound learning and healthy personal development. For some young people, certainly, they can be vastly more productive than schools or colleges. And that is why we consider "educational institutions" to include not only classrooms, libraries, and laboratories, but also other environments where purposeful and effective learning can take place: the workplace, public and non-profit agencies, museums and cultural institutions, the media, youth agencies and community services, field studies and workshops in the out-of-doors, and community-based organizations in the inner city. (p. 129)

One policy response has been the School-to-Work Opportunities Act of 1994, which provides federal funds for programs that incorporate school-based and work-based learning with "connecting activities" linking the two. And so, with the enthusiasm that Americans reserve for the presumptively novel, localities and states have begun planning school-to-work programs, worrying about whether enough employers can be recruited, puzzling through the nature of "connecting activities," and occasionally even worrying about how school programs currently in place need to be modified to fit school-to-work programs.

In the enthusiasm for school-to-work, however, there have been few experiences to guide policymakers and program planners. There have been, to be sure, some

experimental programs established (see Goldberger, Kazis, & O'Flanagan, 1994; Hamilton, 1990; Pauly, Kopp, & Haimson, 1995), though none of them have been around long enough to know much about how they work. Furthermore, there have been some efforts to distill the lessons of existing work-based programs, including work experience, cooperative education, school-based enterprises, and other school partnerships with businesses (e.g., Stern, Finkelstein, Stone, Latting, & Dornsife, 1995). These can be viewed as *natural experiments*—examples where work-based learning has survived despite the strong pressures toward school-based preparation of the workforce. Unfortunately, in most cases, these natural experiments in work-based education enroll small numbers, or exist under special and atypical conditions—small comfort to those who hope to develop a school-to-work *system* in this country.

The case of Cincinnati is different. Co-op programs combining school-based and work-based learning have been present in that city ever since 1906. Though they started in a four-year college—the University of Cincinnati, usually considered the birthplace of co-op in this country—they have since spread to community colleges and area vocational schools. Rather than enrolling just a few students, or one or two employers, they are a dominant feature of Cincinnati, well-known even to those employers who do not use them. The result is that work-based education has become part of the culture, widely practiced and well-accepted by employers, educators, and students alike—a phenomenon that exists, as far as we know, in no other community in the United States. As examples of indigenous school-to-work programs, the Cincinnati co-op programs have advantages that are lacking in more isolated programs.

This monograph therefore describes the Cincinnati co-op programs in detail, in order to derive the implications from this experience for school-to-work programs. There are, of course, differences between these programs and the school-to-work efforts as many proponents envision them. In particular, the Cincinnati programs lack skill standards and the certification of skills—in certificates of mastery and other similar credentials—that are the driving force behind some current school-to-work proposals. But these differences are instructive, too, because they illustrate that school-to-work can become widespread, can be institutionalized, and can be of high quality without skill standards and formal certification.

Why Cincinnati? A Brief History

Cooperative education in this country was started in 1906 by the dean of engineering at the University of Cincinnati, Herman Schneider, to provide work-based experience to engineering students. In the conventional history, Schneider came up with the idea on his own while standing on the Lehigh University campus when he was "startled out of his reverie by the blast of a Bessemer converter at a nearby steel plant" (Ryder, Wilson, & Associates, 1987, p. 5). He tried and failed to join the two enormous facilities in a co-op program, finally succeeding later at the University of Cincinnati. However, the years around the turn of the century were a period of intense interest in the German apprenticeship system, culminating in a speaking tour by Georg Kirschner to several cities in the U.S., including Cincinnati—a visit that encouraged the movement for vocational education, and may well have influenced the development of co-op in Cincinnati.

Schneider, concerned as present critics are with the adequacy and relevance of education to future work, identified two problems that could be addressed through cooperative education: (1) most students worked at least part-time, but usually in jobs unrelated to their future careers; and (2) there were components to the engineering curriculum that could not be taught in a classroom setting, contributing to the fact that many entry-level workers lacked appropriate experiences. Expanding the opportunities available to students through a combination of work-based and school-based learning activities promised to solve these problems.[1]

Most of the early programs were in engineering, primarily at four-year colleges. In 1917, the program at the University of Cincinnati was extended from engineering to business administration. Four years later, cooperative education in liberal arts programs was started with the idea of providing a "clear understanding of contemporary society" to students who otherwise were on sheltered campuses (Ryder et al., 1987, p. 9). Co-op programs were extended to two-year colleges in Cincinnati in 1937 when the Ohio Mechanics Institute—then a private institution, later affiliated with the University of Cincinnati as the Ohio College of Applied Science (OCAS)—adopted co-op because the

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[1] Many of these same elements—the need for students to earn money while in college, incongruities in the way students are taught and how they learn—are present today, yet co-op exists in only small pockets throughout the country. While almost 900 colleges report having some sort of co-op program, it is part of the mainstream educational experience for students in only a few places. See especially Stern et al. (1995) and Bragg, Hamm, and Trinkle (1995).

lure of part-time jobs would increase enrollments. Employers in the area were used to the co-op plan because of the University of Cincinnati's experience, and had recommended the approach when the Institute decided to offer associate degree programs in mechanical and electrical engineering technology. The programs at Cincinnati Technical College started in the late 1960s, partly in response to a perceived void in fields where OCAS did not provide training; as in the earlier case of the Ohio Mechanics Institute, the introduction of co-op programs was eased by the prevalence of this approach in Cincinnati. Parallel to the growth of community colleges in general, there was tremendous growth in co-op education in two-year colleges during the 1960s (Ryder et al., 1987).

While we were unable to uncover any definitive reasons why only Cincinnati has developed extensive co-op programs, the long history of practice is the most common explanation offered by educators and employers alike. There is a tremendous sense of this history among employers, students, and educators, and the co-op tradition tends to perpetuate co-op programs as former co-op students continue the programs. For example, the human resources representative of one company, who had been there for 21 years, said that co-op was prevalent in his company even when he started, and there was a history of employees who started at the company as co-ops:

> We have some employees, as I understand it, who started as co-ops who are still here. My understanding is that we have been in it from the beginning of time, since the program actually initiated. We were one of the first companies to be involved. We had someone retire, about five years ago, he was the vice president of engineering, and he started here as a co-op.

At one company, it was estimated that one-quarter of the 1,000 employees started as co-ops; at still another, three senior vice presidents had started as co-op students, indicating that the experience was common at high levels. These examples of deeply entrenched history were repeated by many companies. The result of the history and prevalence of co-ops is that even new firms start to use them quickly. For example, according to the Director of Human Resources, one of the smaller companies, founded about ten years ago, incorporated the use of co-op workers almost from the outset: "The company started in 1983 and virtually since we started up we've been using co-ops to support our manufacturing and engineering areas." And even firms that have been forced by economic circumstances to give up co-ops hope to return to them, and to return to the practice of hiring their co-op students upon their graduation.

However, while the longevity of co-op programs may explain why there is widespread support for them now, it does not explain why co-op persisted over this long period, or why it expanded from one institution to most of those in the region. The other reasons for the extent of co-op must remain more speculative:

- One possibility, mentioned by several employers, is that Cincinnati's German heritage—with its relatively greater emphasis on collective responsibility and its ties to the apprenticeship system—explains the persistence of co-op, particularly in the approach we describe below as "growing-your-own" employees where employers take considerable responsibility for the education of their co-op students.

- Another explanation is the relatively robust economy of Cincinnati, which has diversified in the past few decades from its base in manufacturing; this has meant that the region has suffered less from the decline of manufacturing in the past two decades, at least compared to many cities of the Rustbelt.[2]

- Employment in the Cincinnati region is less cyclically sensitive than employment in other cities, again because of its diversification from manufacturing. Cyclical variation in employment makes it difficult to continue co-op programs because they are likely to find placements impossible during recessions.

- Finally, the quality of the co-op program—analyzed below—is almost surely responsible for its persistence. It appears that the early programs were of high quality, and both employers and education providers have made every effort to maintain this quality.

In the end, however, the prevalence of cooperative education in Cincinnati remains something of a mystery. The implication for other communities is that developing a culture in which co-op can flourish will require considerable effort in promoting the nature and the benefits of work-based learning—a kind of promotion that is no longer necessary in Cincinnati because of the longevity of co-op there.

Nationally, co-op has remained relatively small. The greatest expansion has occurred in the last three decades, with the greatest increase coming in community

[2] Indeed, we first chose Cincinnati to study after searching for a city where manufacturing was important but where unemployment was relatively low during the 1990-1992 recession.

colleges—particularly after the creation of the National Commission for Cooperative Education in 1962 and the publication of its report (Wooldridge, 1987).[3] Partly as a result of this, cooperative education became codified as a form of education with five basic components, as defined in Title III of the Higher Education Act (U.S. Department of Education, 1991b):

1. alternating or parallel periods of study and employment
2. formal work experience agreements among the institutions of higher education, the student, and the employer
3. work experiences which are of sufficient number and duration
4. work experiences which are related to the student's academic program of study or career goals
5. student work experiences which are monitored, supervised, and evaluated, and which are compensated in conformity with local, state, and federal laws

The General Accounting Office (1991), in a report of cooperative education at the secondary level, concluded that high-quality cooperative education programs share several features: agreement to training plans by students, schools, and employers detailing both general employability and specific occupational skills that the students are expected to acquire; screening of applicants to assure that they are prepared to meet employer demands; selection of employers who provide training in occupations with career paths; adherence to training agreements outlining the responsibilities of students, schools and employers; and close supervision of high school students by school staff through avenues such as monthly worksite visits. We will return to these features as we explore co-op programs in postsecondary institutions in Ohio.

The historical and cultural conditions that have caused co-op to be so prevalent in Cincinnati are difficult to replicate, of course; we know of no other community in the

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[3] For additional information on the history of co-op, see Wilson (1978) and Ryder et al. (1987). The National Commission for Cooperative Education was established as a means to continue the growth of co-op throughout educational institutions. It started by studying co-op programs in existence, and published *Student Employment and Cooperative Education: Its Growth and Stability*, among other reports (as reported in Wooldridge, 1987).

country where co-op is so widespread.[4] But for the fledgling school-to-work programs, the characteristics that have helped co-op programs in Cincinnati to endure and to prosper are important because they suggest the conditions necessary for institutionalizing school-to-work programs in this country.

The Methodology of This Study

We "discovered" the prevalence of co-op programs in Cincinnati in the course of an earlier examination of the sub-baccalaureate labor market—the market for individuals with at least a high school diploma but less than a baccalaureate degree, representing about three-fifths of employment. Having interviewed employers and community college educators in three labor markets in California during 1991-1992, we then decided to examine Cincinnati as an example of a community with much more manufacturing than any of the California communities. The most distinctive aspect of Cincinnati was the familiarity of employers with local educational institutions. In contrast to the other three communities, where employers ranged from indifferent to hostile, those in Cincinnati were uniformly knowledgeable about education providers and generally supportive of them (Grubb, Dickinson, Giordano, & Kaplan, 1992). The difference was entirely attributable to co-op programs, which were widely praised by employers as sources of skilled labor; the other mechanisms linking community colleges to employers—advisory committees, placement offices, student follow-up and tracking, contract education, and licensing requirements—were not responsible for much of the difference, and in any event worked relatively poorly in the other three communities. Not only were employers in Cincinnati less likely to report that the college "is teaching stuff that we haven't used in years," but they were more likely to have personal connections with area colleges and to participate in keeping curricula current and relevant. In fact, of the 35 Cincinnati employers interviewed in 1992, only one was dissatisfied with the co-op programs.

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[4] At one other community college—LaGuardia Community College in Queens—co-op is mandatory, as it is in two of the Cincinnati colleges. But while co-op is prevalent at that *college*, it is certainly not prevalent in the *region*. The LaGuardia program is quite different from the co-op programs in Cincinnati because it is generally unable to develop high-quality placements because of the local labor market; instead, it places great importance on a series of seminars—the Integrative Seminars—to provide students a forum to convert what seem like low-quality jobs into learning experiences (see Grubb & Badway, 1995). In addition, the New Castle County Vocational-Technical School District in and around Wilmington, Delaware, has a well-developed program of internships and co-op placements for their secondary students, and we suspect that employers there have also widely accepted the practice.

In 1993, we returned to Cincinnati and interviewed other employers, as well as additional representatives from three community colleges in the area, to check the validity of what we had learned earlier and to explore questions we had been unable to address at that time. The employers interviewed were chosen on the basis of information gathered in 1992, as well as through recommendations by community colleges as to which employers had a clear understanding of the use of co-op students or which employers offered different types of co-op experiences. In all, we interviewed 54 individuals representing 46 firms in our first trip to Cincinnati, and 12 individuals representing eight firms in our second trip focused exclusively on co-op programs. In addition, we interviewed 14 individuals from four community colleges on our first trip, and then returned to interview 11 individuals in three colleges. While this study is not a census of co-op in Cincinnati, it does reflect a wide range of employers, in many different sectors, and of varying sizes, as well as the complete set of community colleges in the Cincinnati area.

The one disappointment, described later in greater detail, was our inability to uncover much data about co-op programs because neither community colleges nor employers keep information in forms that are amenable to analysis. Thus our "evaluation" of co-op programs, and their strengths and weaknesses, is purely qualitative and relies on what educators and employers reported. However, the consistency of these reports, from individuals in very different positions with quite different motives, was striking, and supports the validity of our conclusions.

In the next section, we describe the structure of cooperative education in Cincinnati. We then detail the benefits of co-op—for students, educational institutions, and employers—using the words of both educators and employers. The final section offers a number of implications of the Cincinnati experience for school-to-work programs.

THE STRUCTURE OF CO-OP EDUCATION IN CINCINNATI

Currently, all of the community colleges in the Cincinnati area offer students the opportunity to participate in co-op education. Three educational institutions offer associate degrees in the greater Cincinnati area. One is a branch campus of the University of Cincinnati—the Ohio College of Applied Science (OCAS)—which offers both two and four year degrees, with co-op as a mandatory part of their programs. Another, Cincinnati Technical College (CTC), offers two-year Associate of Applied Science degrees and certificates in three areas: (1) business, (2) engineering technology, and (3) allied health. Co-op is mandatory in business and engineering, and some version of clinical or work experience is part of the allied health programs. (CTC has recently become a comprehensive community college; it is now called Cincinnati State Technical and Community College.) The third college, Sinclair Community College, is located about 60 miles north of Cincinnati in Dayton.[5] Co-op is an optional part of the curriculum, with the exception of students in business programs who are required to do some sort of internship, and tends to take different forms than in the other two colleges. In addition, the area vocational schools in Cincinnati—the Great Oaks schools, which include four area vocational schools that enroll both secondary and postsecondary students—all include co-op, though on a much smaller scale than the community colleges.[6] Cooperative education has also migrated across the state line into northern Kentucky, where a number of area vocational schools and community college have adopted cooperative education.

Student enrollment in cooperative education programs in Cincinnati is quite high. At OCAS, all students matriculating towards a degree alternate terms in school and on job sites. The cooperative education program places about 300 different students with 250 employers in co-op positions annually. This represents about 35% of the total day enrollment of about 850. (Evening students, who represent another 500 students, do not enroll in co-op.) Because of the structure of co-op at OCAS—where students typically spend ten weeks in school, followed by ten weeks on the job, alternating schooling and

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[5] We included Sinclair because it was frequently mentioned as a source of employees by Cincinnati's employers. In addition, the contrast between Sinclair, with a more traditional co-op program involving a small fraction of students, and those at OCAS and CTC, with mandatory co-op following an alternative pattern, is illuminating.

[6] Great Oaks has two co-op programs that alternative periods of school and work, one in the area of automotive technicians, enrolling perhaps 32-36 students a year, and another in electro-mechanical maintenance with about 8 students. While a number of other programs provide some work experience, they are not extensive enough to be considered co-op programs.

co-op over a two-year period—there are substantially more students placed in co-op each year than graduate; for example, in 1992, there were 94 baccalaureate candidates and 98 Associate degree candidates, all of whom participated in co-op. For the past ten years, over 93% of the graduates wanting full-time employment have reached that goal within the first few weeks following graduation, ranging from a low of 88% (in 1983 and 1984, which were recession years) to a high of 96% (in 1985, 1986, and 1987, all years of substantial economic expansion).[7]

At CTC, during the Winter 1993 term, 531 students were placed in co-op positions; this represents about 21% of the enrollment of full-time students. (Total enrollment is about 5,500; 55% of these are part-time students who are ineligible for co-op.) While co-op is supposedly mandatory at CTC, this requirement is somewhat misleading. According to the co-op coordinators, slightly over half of all enrolled students participate in co-op during any one term. The others fall into different categories: the largest group are enrolled in pre-tech or developmental courses (as described below), and therefore are ineligible for co-op; a large fraction (55%) attend part-time; a small percentage waive out of co-op based on their prior work experience; and some receive some kind of financial aid such as state or federal assistance that precludes them from being hired as co-ops. (College coordinators are quite concerned with this latter group, who often have difficulty completing the programs and finding full-time employment without co-op experience.[8]) The result is that a large fraction of students enrolled are, in effect, ineligible or inappropriate for co-op.

At Sinclair Community College, where co-op is voluntary and often student-initiated, approximately 225 students are involved in co-op each term (about 1,000 students per year). This represents roughly one percent of the average student population of about 21,000 students, the majority of whom (70%) attend part-time. Close to 85% of the co-ops at Sinclair do so in a parallel format, where they take classes in the morning and work

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[7] These statistics are taken from OCAS Professional Practice and Career Placement Reports for 1991 and 1992.

[8] A special problem involves the various income-conditioned programs available to students. Low-income students—including many minority students—may be eligible for Pell grants, or AFDC; but they are likely to earn enough as a co-op student so that they become ineligible for the grant, in effect forcing them to choose between co-op and a grant. In addition, JTPA clients may be made ineligible by the amount of employment they have in co-op. The problem in this case is that what is intended as an educational experience is treated by other federal programs as simply a form of employment; a change in eligibility procedures and earnings calculations would be necessary to give co-op programs special status.

part-time in the afternoon. The largest group of co-ops is in the business technologies area, which has an internship requirement. Sinclair co-op coordinators use a data bank of about 500 local employers to find placements for students. In general, Sinclair's co-op program is more traditional—largely voluntary, with a much smaller fraction of students participating, and following a parallel format.

Another way to understand the magnitude of co-op education in Cincinnati's two-year colleges is to consider the size and purpose of these institutions. The two-year colleges in Cincinnati are, by urban standards, relatively small—much smaller than the institutions with enrollments in the order of 25,000 that one finds in many urban areas, including Dayton. Furthermore, because OCAS and CTC are technical institutes with well-defined occupational programs, they probably attract students with relatively clear occupational goals—in contrast to most community colleges, many of whose students are "experimenters" trying to figure out what kinds of careers to follow. Even so, many of the students in OCAS and CTC are part-time students, or evening students, or are completing remedial coursework; the numbers of individuals who are full-time students in occupational programs is therefore relatively small—and these are the individuals most likely to participate in co-op. This represents a kind of selection mechanism for "seriousness," with only those students with a serious commitment to a particular occupational area enrolling in co-op—a point to which we return later in this report on the quality of the co-op program; therefore, the numbers enrolled in co-op may seem small, but they are a large fraction of the seriously committed occupational students.

Yet another way to assess the magnitude of co-op education is to examine the practices of employers. It is difficult to determine how widespread participation in co-op education is among employers in the area, since that would require a survey that no one has undertaken. However, in an earlier study of four local labor markets, including Cincinnati, we interviewed 54 individuals representing 46 firms in the Cincinnati area, chosen at random from firms likely to hire any of six specific occupations,[9] as well as two individuals with broad knowledge of the labor market. All of these firms knew about co-op programs. Of the 35 firms who had participated in co-op at one time or another, only one had discontinued its program, because of a general downsizing, and all of them

[9] See Grubb et al. (1992). The six occupations were electronics technicians, machinist, drafter, accountant, business occupations, and computer-related occupations. The important point is that this earlier study did not select firms according to the presence or absence of co-op education.

expressed support for co-op. While the sample of firms interviewed cannot be considered a random sample of employers in the Cincinnati area—since it was chosen to contain six specific sub-baccalaureate occupations, and since small employers were underrepresented—it does reflect a substantial cross-section of employers, and suggests that both the use of co-op students and support for the program is widespread.

In a more recent investigation of co-op education in Cincinnati, we interviewed only employers who were currently employing students in co-op arrangements.[10] These employers' co-op programs ranged in size and scope. The smallest company, with twenty permanent employees and four co-op students, estimated that about one-third of their permanent employees came through as co-op students. One of the larger companies employs over 13,000 employees and about 100 co-op students in ten locations. This company also typically offers permanent positions to a majority of its co-ops upon graduation. This sample of employers cannot be used in any way to reflect the extent of co-op education in Cincinnati, of course, since the firms were chosen for their participation in co-op education; however, this sample does indicate that when firms participate in co-op, they often employ relatively substantial numbers of co-op students and do tend to hire them for permanent employment.

Another way to see the magnitude of two-year college co-op programs is to compare their numbers with the numbers employed. There are about 830 co-op students per year placed from the two two-year colleges in Cincinnati. In 1990, there were about 359,000 individuals ages 20-64 in Harris County (where Cincinnati is located), of whom roughly one quarter (24.3%; about 87,000 individuals) had some college. The number of new hires might have been in the neighborhood of 2,200,[11] and so it is plausible that one-third to two-fifths of new hires at the sub-baccalaureate level came from co-op programs. Over a period of time, such a pattern would obviously result in a considerable fraction of the workforce being knowledgeable about co-op programs. Furthermore, several of the large and prominent firms in Cincinnati have made extensive use of co-op, further contributing to its reputation.

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[10] Those interviewed included individuals from human resource divisions. In a few firms, we interviewed the vice president for operations or the manager in charge of the co-op program.

[11] If individuals work for about 40 years, and there is a rectangular distribution of years in the workforce, then 2.5% of a workforce will be new hires each year. With an expanding workforce, the fraction of new

Current state support for co-op comes in the form of reimbursement for students even while on the job; that is, students are enrolled and the colleges continue to receive state funding, through the regular mechanisms of state aid to community colleges, for students during their work terms. These funds go into the colleges' general funds, though they tend to be used to support the additional costs associated with providing co-op—especially the costs of hiring co-op coordinators, as well as the marginal costs (in some cases) of having to offer courses more frequently to accommodate students on co-op schedules. The importance of this funding mechanism is that co-op programs have a stable funding base, rather than having to rely on grants, contributions from employers, or other special funds that can dry up.

Even within one relatively small geographic area, co-op programs take many forms. In this section we describe the structural differences among co-op programs, how they are initiated and organized, the processes of selecting students, the factors that contribute to quality, and the potential roles that state and federal governments might play in fostering work-based learning.

Alternating vs. Parallel Programs

Cooperative education as an educational methodology shifted dramatically in the 1960s in part because of the enormous growth of community colleges and their adoption of cooperative education. In addition, major changes occurred as a result of the increased dominance of "alternating" as opposed to "parallel" co-op programs, a shift credited with changing the conception of cooperative education dramatically (Ryder et al., 1987). Alternating programs involve students in education-based learning for a period of 10 to 15 weeks, followed by work-site experience for the same amount of time. In contrast, parallel programs split the day between school (usually in the morning) and work (in the afternoon). The parallel method was greatly influenced by the characteristics of students attending community colleges: Older, nontraditional students with financial needs different from those of traditional undergraduates were thought to be better served by the parallel program because of the ability to earn a salary while continuing in school.

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hires will be somewhat higher, though in practice there has been expansion and contraction at different periods in the past and the proportion of new hires surely varies a great deal.

The alternating model of co-op is generally considered the classic model: It is highly centralized, usually does not award credit, and may require little direct involvement of the teaching faculty. According to the literature, it tends to function best in professional areas of study and in fields with large numbers of students. The parallel program, as defined in the Higher Education Act, involves "periods of both classroom study and monitored and supervised public or private employment of a student in a cooperative education project, with the student carrying a half-time academic courseload and working about 20 hours per week in a cooperative education work experience." Parallel co-op shares many of the features of work-study or less organized work experiences. There have been adaptations to the cooperative education model by institutions to fit their own conditions; however, the characteristics of alternating and parallel forms are fairly constant.

The most common form of co-op in Cincinnati is the alternating model. It is considered a more intensive learning experience for students since at any one time their focus is not split between school and work. Typically, a student goes to school for a 10- or 13-week term, and then works with an employer for the same amount of time, repeating this cycle two to six times. At OCAS and CTC, almost all co-op students follow this pattern. At Sinclair, however, the majority of the arrangements (90%) are parallel. One coordinator said that most of the employers there prefer parallel to alternating programs. However, work positions in a parallel program may not necessarily last the same period of time as a school term; therefore, students sometimes work at a part-time job year-round. but apply for co-op credit for it during a particular term. Because Sinclair is set up to facilitate parallel programs, students in areas that typically have alternating programs (such as engineering) encounter difficulties in sequencing their coursework when they choose to co-op in alternating terms.

The choice between alternating and parallel models is also related to the characteristics of students. Those in the alternating model are required to attend courses full-time during the school term and to work full-time during the work term. Parallel students at Sinclair can attend part-time and work part-time. Thus, the part-time students typically enrolled at many community colleges are better able to participate in parallel co-op, and can continue to earn a living while enrolled in classes. In general, however, the alternating program has been cited as more beneficial because of its stronger link between students and communities, especially at community colleges (Wooldridge, 1987). While the lack of data prevented us from ascertaining the advantage of one over the other in terms

of long-term outcomes, Cincinnati employers tended to prefer alternating co-ops. They reported that students were more focused, since their energies were not split when they alternated work and school terms. In addition, employers thought that it gave students a welcome break from school.

On the other hand, one firm that tends to use alternating co-ops also hires two groups of parallel students to work four hours a day throughout the year on special projects; thus, the company gets complete coverage and students continue their school work as well. They cite continuity as an advantage to the parallel approach since projects can be longer than 10 weeks. As one manager stated,

> They [students in parallel programs] are somebody you can depend on all year long and they get a lot of small projects that can be done in half a day. You never have a change with a parallel.

In contrast, employers with alternating arrangements usually hire two students into one position, so that the position is always covered when a student returns to school; but this involves some discontinuity between the two individuals.

An added challenge to alternating programs is the issue of sequencing courses so that students are able to enroll in appropriate classes. OCAS and CTC reported added costs to offering the same courses each term in order to accommodate the schedules of students in alternating work placements. As one co-op administrator mentioned,

> In an alternating program, such as the one we have, the courses must be taught twice, unless the same courses are taught in the summer and the fall and the same courses are taught in the spring and the winter. So the cost to just teach the courses is about 25% greater.

Students attending institutions like Sinclair that are less committed to alternating co-op must struggle to get the right courses in their school term, or end up arranging co-op positions based on course offerings instead of appropriate job positions.

In parallel programs the distinction between part-time work, of the sort that most community colleges students have, and co-op experience is often unclear. The relatedness between what students study and their co-op positions seemed somewhat loose at Sinclair. There, coordinators sometimes relied on the notion that any work at all might be educative. As one mentioned about an unrelated position, "It's a job; they're learning important skills about what it means to be a worker."

However, alternating co-op placements are quite unlike part-time work and informal work experience programs, on the one hand, and conventional clinical teaching, on the other; the extensive placement in actual work settings creates the difference. The experiences of the nursing program at CTC—one of only a few in the country in which students participate in cooperative education—illustrates the difference between a clinical experience, a "sheltered experience," and a co-op placement where an individual is responsible for a job. As the coordinator stated the difference,

> Clinical experience tends to be a sheltered experience. There is always an instructor present physically in the environment who is responsible for the students. As a co-op employee, the nursing student is functioning within a job description for which they're prepared.

Decentralized and Centralized Co-ops

Colleges differed in their administration of co-op. Two of the institutions had central offices for co-op placement and evaluation; the other college had a decentralized system. In decentralized systems, placement personnel are located in departments or divisions and tend to have specialty areas, while centralized programs use placement personnel to assist students in all occupational programs. There are advantages and disadvantages to each.

Cooperative education is decentralized at CTC by division. There are three divisions—business, engineering technology, and health—each involving a department chair and four or five co-op coordinators. Co-op placement officers in each of the three divisions are responsible for matching students with appropriate work experiences. The coordinators' roles include soliciting employers for jobs, assisting students with their résumés and interviewing skills, and visiting students on the job once each term to evaluate the quality of work experience as well as student performance. Coordinators have a case load of students, and typically place between 30 and 60 students per term. This decentralized system allows coordinators to specialize in broad occupational areas and to work consistently with certain industries, thus building up strong relationships with employers in the area.

Another advantage of decentralized co-op is that it allows coordinators to develop strong ties to faculty in their occupational areas. For example, in the Business Division at

CTC, four of the six coordinators were formerly instructional faculty, and they maintain close working relationships with the current instructional faculty. Because of their specialization, coordinators can draw on prior experience in the industries for which they place students; for example, the coordinator in the culinary program is well connected with hotels and restaurants in the area. The dean of the division felt strongly that the decentralized organization made for a better program:

> There is still debate in this institution whether that's efficient, whether it would be nice if we had centralized co-op. I like it where my coordinators are part of the cluster so they get to know who the students are. . . . Let's use the big debate—we have some old typewriters. Do we get rid of our old typewriters and put in computers? Will we go out and buy $12,000 worth of new typewriters? Well our coordinators have been saying, in the uniqueness of Cincinnati, they [students] still need to have typing skills. They still need to understand what a typewriter does. So that's input that my coordinator can put into that area back there. If they were part of a centralized office and didn't have the avenue to make that input, they may run out and buy computers when our co-op employers are still saying we want our students to understand and be able to work on a typewriter.

Another advantage cited for decentralized co-ops involves the opportunity for close relationships between students and coordinators. In the Engineering Technology Division, for example, placement for students completing the program is done informally but relies on the connections between the co-op coordinator and the business community. As one coordinator said,

> We know who the students are. We go through and match up résumés with what the employers are looking for when they call us. So it's a very specific type of résumé referral and a lot of them like it. They depend on us. Now and then we do interviewing skills, job search workshops, and we have some materials that we prepare and give the students. The other divisions do not do it. In business, it kind of varies on programs. Some of the coordinators will work with grads; some won't. In health, I think their grads probably are placed so easily, and it kind of takes care of itself. So it varies and that's one of the differences [between centralized and decentralized co-op and/or placement offices].

There are also disadvantages to decentralized co-op operations such as duplication of effort and potential for increased costs. Duplication might involve the development of strong relationships with employers who hire from more than one division, as well as some administrative functions involved in coordination.

In contrast, co-op is centralized at OCAS through the Professional Practice and Career Placement Center. Co-op and permanent job listings are available, as are extensive resource materials on job search strategies, résumé writing tips, and information on area employers. Two professional coordinators and support staff operate the center. Students must enroll in a professional development course, work with either of the two placement officers to develop their résumés, and apply for positions listed in the office. The interview with an employer may take place at the center or off-campus. At OCAS, approximately five hundred students are placed in co-op jobs with about 180 employers each year. The relationship between the two co-op coordinators and the instructional faculty is quite strong; the director of the placement center is a department head and, as such, meets regularly with other department heads. The co-op placement function is considered to be integrated with the academic programs and because of this the centralized organization strengthens rather than detracts from the programs. As the director stated,

> If they want to change curriculum I sit on the curriculum committee. When we have advisory board meetings, they attend ours and we attend theirs and so on. So we have a very integrated relationship.

However, because there are approximately 30 full-time faculty, and many more part-time instructors, each co-op coordinator needs to work with a large number of faculty from a variety of occupations.

Sinclair is significantly different in its approach. Co-op is centrally coordinated in the Experience Based Education Department of the Extended Learning and Human Services Division. The cluster within Experience Based Education includes programs such as College Without Walls, Credit for Lifelong Learning, Associate of Individualized Study, Associate of Technical Study, and Cooperative Education. Four coordinators work to find positions for students, work with students on résumés and career exploration, and coordinate with professors to grant students credit. Students at Sinclair tend to co-op in a parallel program, which makes placement efforts more complicated and ongoing. As stated earlier, co-op is organized at Sinclair like other auxiliary services; it is an additional option for students, not a central component of their program.

How Employers Organize Co-op

Employers in Cincinnati differ in their methods of working with colleges to hire students, as well as in how they structured the work experience. Common to every employer, however, was the importance of a strong relationship with the college. This relationship most often came through the co-op coordinator, whom they could trust to provide strong students.

The quality of the co-op experience for a student is substantially affected by how the work is organized. At some firms, students rotate through different departments in order to learn more about the company. At one large company, for example, students' assignments change considerably, depending upon openings and the students' preferences. As the personnel director explained,

> Many students will want to stay in one location because they've become familiar with the supervisor. And the supervisor will give them much more challenging projects if they know them and they want them to come back, and the students get excited about what they're working on.

Many employers also design the co-op placements by what they want students to learn. One employer described the purpose of co-op as follows:

> They learn the academic skills at college. One of the first things, the most beneficial, is they learn to work as a team in co-op. Because when you're in college you're working by yourself, against yourself, competing. But the first thing you learn is to be a team when you come here. And that is so important because in the past people never taught that. And we really emphasize it now; it's all team work, team building. They are expected to learn to be able to take risks, leadership skills, all those normal things that I think you expect.

The larger companies, which tend to view co-op as a recruitment process and a way of "growing their own" employees, tend to move co-ops around to different parts of the company more often. In some cases, co-op students are in small training groups that move among various divisions. One particular firm, which is committed to co-ops as long-term investments, purposely moves students around different positions because it provides better training for the long term. As one manager stated,

> Every supervisor and every manager is far better at doing what it takes to give them the skills to grow. And from day one, our supervisor is a man who has been taught that co-ops are the seeds of our future. And that the co-op period is a time where we provide the fertilizer. We give them the

> training. We open the doors. We give the opportunity for experience and if we do that properly we will be able to be successful five, ten, fifteen years down the road because we will have developed the kind of people that will have the ability to continue to grow in the company beyond a couple years after graduation.

At other firms—particularly those that view co-ops as an immediate source of low-cost, high-quality labor rather than a source of "growing their own" employees[12]—co-op students may stay in one department for multiple work terms. At some firms, in-depth training in one area provides the student with high quality experience that transfers to other areas; at other firms, unfortunately, students who worked in one area might get fairly narrow firm-specific training. At two of the smaller companies where students tended to work in particular jobs, there were some attempts to present general information about the company. However, this kind of activity was comparatively rare in firms that kept co-op students in one position.

In addition, at firms where students have a variety of placements, managers may arrange special seminars for co-ops to be exposed to varying phases of the business. At a larger company, a manager responsible for a number of co-ops recently decided to extended their education beyond the engineering area by setting up a forum with the executive vice president of finance in order to expose students to "all phases of the business." Students were given the opportunity to ask questions and learn more about the company. Another large employer, which hires 80 to 100 co-op students each term, has a number of activities for students including a co-op newsletter, social functions, and informative seminars. They do this for two primary reasons: (1) co-ops tend to work in isolated parts of the company and (2) the firm has an older workforce. The company wants co-ops to feel welcome and included, and therefore goes to great lengths to integrate them into company activities. The practices of moving students to different positions in a firm, and of providing seminars to teach them more about "all phases of the business," are reminiscent of the option in vocational education programs of learning about "all aspects of the industry" in order to provide a broader form of workforce preparation.

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[12] The "grow your own" approach tends to develop a broader range of competencies, comparable to the broadly transferable skills of the "learn and go" model profiled by Stern and Rahn (1994), while co-ops as a source of immediate labor are similar to the more specific training of the "learn and stay" model.

In still other cases, firms develop a partnership with local colleges in ways other than hiring co-op students. As one employer described the relationship,

> We recently had a partnership day with a technical college, and the heads of the departments and the placement officers and some of the teachers came to [the firm] for a couple of hours and we had a tour of the company and then we had a brainstorming session on how we can help one another. And we provide tours for classes at these schools, plus we also provide guest speakers. We send our engineers and our machinists over to do a class if they want them to. And then also where the schools are recruiting at the high school level, we send one of our managers and one of our employees that used to be a co-op, and they do high school recruiting with the colleges as well. So we don't take a co-op from college and say we're going to give them a job. We develop the whole partnership aspect. We don't just take their people; it's more like "how can we help you develop your students."

In general, we found that firms using cooperative education as a way of "growing their own" employees tended more often to rotate students around positions and to provide seminars, other learning experiences, and ancillary activities with the local college. This is consistent with an explicitly educational view of co-op, with an emphasis on the firm's contribution to the student's learning and growth. As one employer in such a firm stated,

> The student is a student at all times. We are part of the education process. We provide training, we provide exposure, we provide ability to practice. They are most valuable when they graduate. Therefore, they get moved around to different assignments, receive wide exposure.

Initiating Co-ops

An important consideration in a new program like school-to-work is the process of implementation. How do programs get established? What are the most beneficial partnerships between schools and employers? In the cooperative education programs in Cincinnati, there are three perspectives from which to examine this: those of the education providers, of employers, and of students.

The Role of Education Providers

Co-op arrangements involve considerable preparation by coordinators at the three colleges. Whether the offices are centralized or decentralized, coordinators spend much of

their time finding job opportunities for students.[13] Each of the three colleges have direct marketing materials in the form of brochures and information packets espousing the benefits to employers who are involved with cooperative education. Coordinators described the mad scramble to find co-op positions each term, despite their long-standing relationships in the community. At some companies, they know they can depend on a certain number of co-ops; but for the most part, there is considerable uncertainty about which firms will provide appropriate placements. In terms of initiating co-ops, coordinators employed a variety of strategies: calling on former students who are now permanently employed; attending Chamber of Commerce activities; and working through program advisory committees. Even in Cincinnati, then, with its long history of co-ops and well-established programs, there is some uncertainty about whether enough high-quality placements can be found.

The Role of Employers

While some co-op placements were initiated by coordinators at the colleges, in other cases employers contact co-op coordinators when they need to hire students, and interview different colleges to find the right programmatic match. Other employers, who were in long-standing relationships with educational institutions, had the equivalent of standing orders for co-ops each term.

In choosing programs to work with, some companies undertake an extensive selection process. As one company representative stated,

> Before we have a co-op program, we have to define the need for what our potential employee growth is going to be. And once we determine that, then we determine what kind of person do we want and ultimately what kind of position would they have. And then we contact five, six, seven, or eight schools and we narrow our choices down to three; we make a campus visit and talk to their instructors; we interview their students; we audit a class; we examine their curriculum; and then we invite them here to do the same with us. We share our mission statement, the future direction of the company, and then we select one school. For instance we use the University of Cincinnati for electrical engineering for their four-year degree program, but we also use Cincinnati Technical College for their mechanical engineering, but not the University of Cincinnati. So it depends on what the curriculum is, what is the kind of education they get; theory versus practical or hands-

[13] At Sinclair Community College, the co-op coordinators have the double challenge of recruiting students in addition to employers because of the voluntary nature of co-op there.

At another firm, the human resource director described how she works within the company to define the job, and then interviews colleges:

> What I'll do is ask for an appointment with the managers and I'll talk with them about what major would fit the bill. What colleges in the past have been helpful? Since we have a long history, it's always nice to see if there is a college that isn't teaching the right curriculum, even though they may be mechanical engineers, but this college tends to focus more on the equipment we have, or whatever it might be. Then we'll go to that college. So we base a lot of it on history . . . .
>
> I introduced [a new college] to the dynamics group, they weren't familiar with them. They had mechanical engineers from another college and they were not pleased with what they were getting. The students were not specific enough to the task. . . . So he [the manager] was not pleased with that school. And I said "why don't I introduce you to [the other college's] electro-mechanical program; let me get you the curriculum." I met with the manager and supervisor again and said "this is the curriculum, this is a profile of what the college has to offer, why don't we interview a couple and see what you think?" He was much more pleased with what he's seeing.

In that instance, the manager shifted from a four-year program to a two-year college that was able to provide a more specific curriculum.

In describing how they choose educational institutions to work with, a few of the employer coordinators—some of whom had been at their company for more than twenty years—mentioned that the relationships with the schools preceded them. This does not mean, however, that they continue with schools when the quality decreases. Rather, there seemed to be ongoing discussions about whether the programs still match their needs. As one employer stated,

> The relationships with the engineering schools, at least with the University of Cincinnati and the Ohio College of Applied Science, was before me. So it was just really kind of a continuation. Cincinnati Technical College was just sitting down and talking with people and saying "here is a need, how can you satisfy our need?" So we did some interviewing at some schools

In general, employers recognized that there was considerable investment on their part in making co-op placements work—investments that took the form not only of providing placements, but also of donating equipment, money, and other resources such as participating on advisory committees or offering their site for classroom field trips. Employers were therefore highly conscious of selecting the appropriate institution for their co-op program. But the benefit of this deliberation, and of the search process that often

preceded new co-op programs, was that employers were quite familiar with a variety of educational programs; this eliminated the gulf between providers and employers that exists in so many local labor markets.

The Role of Students

Students also can initiate co-op arrangements. In the parallel programs at Sinclair, students already working in jobs often contact the co-op office to determine a way to receive credit for their work. Students may also have particular companies or jobs in mind, and then work with a coordinator to create the position. Since co-op is optional at Sinclair, students are more likely to make the first move in contacting the co-op office to find a position. The exception to this are minority students, who may be targeted by coordinators to participate in work-based learning programs.

In addition, one employer said they receive requests for co-op positions from students at colleges who do not have formal co-op programs. This happens more often at the four-year engineering level, however, where entry-level positions have become increasingly competitive and graduates often need work experience in order to compete. This employer said it was harder to work with students from colleges without organized programs, but that they try not to discriminate against motivated students who want the experience.

The disadvantage of student-initiated co-ops, however, is that they fail to create *institutional* linkages between employers and community colleges. Student-initiated placements appear similar to the kinds of employment that students normally have to finance their postsecondary education, for which they then get co-op credit. But student-initiated placements are less appropriate for keeping educational institutions abreast of labor market developments, for modifying their curricula in response to changing demands at work, or for developing permanent placement opportunities for other generations of students.

Credit and Pay

All work assignments in the co-op programs at OCAS and CTC are paid, though co-op jobs at Sinclair may be paid or unpaid. The unpaid jobs tend to look more like short-term internships without significant responsibilities, though the college does not differentiate between the two forms of work experience. (The other colleges tended to define internships as one-shot work experiences, often during the summer, contrasting this with the repeated work experiences of their co-op programs.)

Wage rates vary considerably: students are paid anywhere from the minimum wage to about $12 per hour. There are roughly two categories of employers: those who treat co-op students like regular employees in terms of wage increases and evaluation; and those who considered them more like temporary or part-time workers. The larger employers with a longer history of co-ops tend to fall into the first category, offering co-op students vacation and holiday pay, pay increases after a certain period of work, and even (in one case) the opportunity to participate in a shared profits plan. Small employers, and those using the parallel approach, were more likely to pay minimum wage, according to co-op coordinators.[14]

A fairly common practice is for co-op students to be paid more as the number of co-op quarters increased—that is, as they become more valuable to the company. At one firm, students from two-year programs start out at a lower wage rate than their four-year counterparts, though at other employers wages are set by position regardless of whether it is filled by a two- or four-year student. In general, the colleges have little influence on pay rates, increases, or benefits in general. The coordinators generally agreed, however, that the students' primary benefits are work experience, and that working more rather than less is important. Therefore, they recommend that employers not offer vacation or sick days during the work terms, in order to reduce the incentive for taking time off.

The three schools differed in their approach to granting degree credit for co-op experience. At OCAS, a certain number of co-op terms are required of each program.

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[14] Co-op programs are amenable to numerous variations. For example, one college has an arrangement with an employer who employs numerous co-op students, but contracts with the college to pay them so students do not appear on the firm's payroll. This is a company which has gone through major restructuring involving extensive layoffs. The company chose to arrange it this way in order to report fewer workers on their books.

However, academic credit is not granted for the co-op terms. During the work term, co-ops are considered full-time students and must register and pay a $50 fee.

At CTC, students receive 10 credit hours towards their associate degrees for co-op work experience, and these 10 credits are required for graduation. Co-op credits can be earned in three ways: through successful completion of a co-op assignment; through a petition for co-op credit based on previous work experience; and by substituting approved courses for the required co-op credit. Certainly the most common method of earning the credits is the first option, completing multiple on-site co-op jobs; on average, only about five to ten percent of students substitute courses or previous work for co-op experiences.

At Sinclair, students can apply for credits ranging from three to twelve hours towards many of the programs. Faculty members serve as "facilitators"; their duties are to work out the contract with the student as to what he or she will be doing on the job, visit the work site once during the term, evaluate the student, and assign a grade for the term.

The Selection of Students

Access to worthwhile educational experiences is important in any school-to-work program, and screening mechanisms can potentially discriminate against students most in need of high-quality programs. In Cincinnati, the selection of students for co-op programs appeared relatively open and fair. There are two elements to the selection and screening of students: (1) the requirements by the participating colleges and (2) the ways employers select students.

Program Requirements for Co-op

Because colleges in the Cincinnati area vary in their selectivity and in their requirement for co-op, the college requirements before students can take co-op vary as well. OCAS probably has the most requirements given its competitive admissions criteria. The two major programs at the college—engineering technology and construction management—require certain levels of high school math and science, as well as particular scores on standard college admissions tests in order to be admitted to the two- or four-year programs. If a student does not meet the requirements, he or she is able to take preparatory courses until admitted to the program. In addition, the college offers a summer bridge

program for students who need an additional math or science course. In addition, students are not placed in co-op programs until their third term, so that the college has a chance to evaluate—and correct if necessary—any academic deficiencies students may have entered with.

In order to enter a co-op program at CTC, a student must maintain a 2.0 grade point average, attend full-time, and be "on track with the proper sequence." The students enrolled who are not enrolled in co-op are generally taking "pre-tech" courses or are attending part-time. All new students take the ASSET exam, testing their abilities in basic math and English; students who are weak in a particular area then start in the pre-tech program. (If interested, they can be admitted directly into an occupationally specific pre-tech program such as pre-engineering technology.) A pre-tech counselor works with the student to plan the courseload; upon completion of the remedial work, the student transfers to the major and is eligible for co-op.

Because CTC (unlike OCAS) is an open-admissions college, planning for co-op jobs is particularly challenging for coordinators because they never know how many of the entering students will pass the ASSET placement test or the pre-tech courses and be eligible for co-op. As one coordinator explained,

> Because of our open door policy, we cannot estimate how many students are going to come in a term asking for placement. At the beginning of each term, we have a co-op orientation, put signs around, notify everybody. Any new student comes to orientation, they show up. Some orientations we might have 200, you know in the fall and then of course in the spring and summer it's smaller. We tell the students all the procedures. We give them deadlines for turning in their résumés. And there's also a form that their chairperson has to send in to say that they're eligible for co-op. And once they're eligible and turn in their résumés, then they're a case. Students are assigned to coordinators by program.

OCAS and CTC offer only vocational programs, and so they attract students who intend to prepare for employment. At both institutions, however, students must be enrolled in *programs*, not just a series of unrelated courses, in order to participate in work-based experience programs. This practice effectively eliminates the students, so common in many community colleges, who are unsure of their purposes or uncommitted to postsecondary education.

Sinclair is also an open admission college, and participation in co-op is optional. The strongest co-op programs are in the business technology area, which includes accounting, aviation, travel, and computer fields. There are also a number of students from the engineering programs who co-op. Selection of students for participation is somewhat different at this college. The central co-op office does a fair amount of marketing on campus about their services, and has enlisted faculty in certain programs to encourage students as well. In order to enter a co-op, a student must maintain a 2.0 grade point average, have completed at least 12 credits, be working to obtain an associate degree or certificate in an academic program, and complete the introductory co-op/career planning course. There are no part-time or full-time requirements, as most students co-op while enrolled in courses.

In all three institutions, then, there are screening mechanisms to ensure that students entering co-op programs are relatively committed, and that they have either eliminated any academic deficiencies or have maintained a minimum grade point average. These co-op programs are not for the casual students who are so numerous in community colleges, or for the "experimenters" who are casting about for an occupational area to enter, or for those with serious academic deficiencies. As we will clarify, these screening mechanisms are crucial for the colleges to maintain their end of the "high-quality equilibrium" that characterizes the Cincinnati co-op programs. In the process, of course, students without the necessary requirements are screened out, and these may include low-income students who have done poorly in high school, or women and minority students who have not taken the required math at OCAS and CTC.[15] Every college has some remedial efforts in place, however—preparatory courses and the summer bridge program at OCAS, pre-tech courses at CTC, developmental courses at Sinclair—making it possible for students committed to these programs to enter them even if they lack the prerequisites.

How Employers Select Students

At a few of the larger firms, initial contacts, screening, and sometimes hiring is done through a human resources department. At smaller firms, managers often screen applicants, whose résumés are sent by co-op coordinators, and then conduct interviews. While some of the firms treat co-ops as a special group of employees, in many instances the hiring arrangements are almost identical to those used for permanent employees.

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[15] As part of the general lack of data, we were unable to obtain any information about such effects.

The employers choose to work with colleges based on the nature of their programs, and most employers seem to know the curricula fairly well. For example, one company said they choose students from different colleges (both two- and four-year colleges), depending on the program and the direction they want the co-op student to take. One employer stated its goal of hiring students from four-year colleges because they were likely to have longer term goals:

> Most of the students at OCAS that we end up getting usually are the four-year students. Generally, even if they come in with the idea that they're going for their associate degree, by the time we're done with them, they go for their bachelor's. We've convinced them that it would be very important, that it could help them later down the road.

However, employers differ in their use of two- and four-year students, and some firms chose students from vocational associate degree programs (rather than transfer-oriented programs) because they did not want to lose them to baccalaureate programs in a few years.[16]

Employers also prefer students who are local and plan to stay in the area. The perception at some companies is that two-year college students are more stable in this respect. Some companies hire two- and four-year students interchangeably, while others match their needs for short-term and long-term work. According to the personnel director at a manufacturing plant, they choose the student who matches the type of job that they think they'll fill in the future:

> With electrical engineering, our thinking is that we want the baccalaureate education because of the need for more theory in what we do. The mechanical engineering, a lot of our needs, associate education is just plenty . . . So we choose it as much as anything based upon what we think three to five years from now are the types of educated persons that we need in those positions.

In another pattern, co-op students are selected by the coordinator at the school. While the personnel representative of the employer has final say on the hire, they defer to the coordinator to place an appropriate student with them. One employer representative emphasized the importance of having a good working relationship with the school:

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[16] However, most students continue to co-op when they transfer. Surprisingly, there is little problem transferring from the two-year to the four-year program, even when it involves switching institutions. As the coordinator stated, "It really isn't that big of a deal to transfer; it's just a matter of working the classes out and the credits out accordingly with the counselors."

> [The coordinator] doesn't send us anybody that she doesn't feel would work out. She's been in the position long enough to know what our understood requirements are, so to speak.

However, another employer commented on having to be careful about the coordinators' helpfulness because of the colleges' goal of placing all students:

> You know some of them do a pretty thorough job; sometimes they don't at all. And between the institutions, the counselors and the coordinators are all different. At [one particular college], we've got one coordinator who says "take a look at her, take a look at him, you'll really like them." You've got others who push like crazy people they have trouble placing. And if you listen to them you pick up the people that are hard to place because it is their good feeling inside that they're going to do a wonderful thing and place somebody who is struggling with school and struggling with everything else. So you have to look at the individual coordinator to know whether they're helping you or getting a 100 percent placement, and you can usually judge from that.

Even where employers select their own students, they may still rely on college coordinators to help in the selection process by screening out inappropriate students. For example, the co-op representative at a large company with considerable history in co-op admitted,

> Another thing that I think that helps us with the interviewing process is that the schools are very good to screen out. They're not going to send me someone that they know [our company's] high standards are not going to be interested in. When I call and I say I have an opening, sometimes I will send them a summary. And one of the first things they'll say is "what is your GPA requirement? What are the skills? Do they have to have experience or can they have worked at McDonald's and this be the first job?" Will the curriculum, in other words, satisfy the needs of the job or do they have to have a previous co-op experience? So that helps, that thoroughness helps.

One of the smaller companies tends to rely heavily on the relationship with the college co-op coordinator to not only screen applicants, but to find the right match for them as well:

> We develop relationships with most of those people so they understand what our needs are and what kind of person succeeds with us and what kind of person doesn't. So they keep an eye on new people coming in, or people coming back from a job that isn't going to be available next term and they'll send us a little blurb about what kind of person they are. Then we'll interview them. And if the chemistry looks right, we typically make an offer . . . Generally, we work with [a particular local college] and primarily I guess, like anything else in our business, it's people oriented. We've got

> a good contact in [the co-op coordinator], and that relationship has just worked so well that we tend to rely on him for most of our technical co-ops in the assembly area.

At one of the companies that hires over 100 co-ops per term, selection of students is a year-round effort. While most of their co-ops are baccalaureate students, the process for selecting associate degree students is equally challenging. As the recruiter stated,

> Most people think the recruiting or getting a co-op is just showing up on the college campuses, and that's not how it is done. I'll spend the majority of my time traveling, involvement, working with the college or university, so that by the time I'm ready to recruit, the right students sign up on my schedule. So, for example, I was at Cincinnati Monday, I'll be at Georgia Tech tomorrow. It is not open sign up per se, but the faculty and the co-op administrators determine my schedule. Or the students come in and say I want to talk with (company). So mostly, I have six key schools that I recruit at and the other ones are on a referral basis. And I do that because I think you only have the time to give to a select number of schools.

This same company chooses educational institutions based on the school's interest in them as well as proximity to one of their eleven locations. A "well-disciplined" co-op program at the college is much easier to work with, and therefore they will go to extra efforts to recruit students there. (The elements of a "disciplined" program include rules, requirements, and structure.) For this firm, the availability of classes is critical to the success of a co-op program so that students can rotate terms working and attending classes. The high enrollment of women and minorities is also important, since this firm uses co-op partly as a way to recruit qualified women and minority workers.

Firms have different requirements for co-oping, including term limits. At two companies, students are required to spend at least two quarters with them due to the high cost of training and supervision in the first term. Some employers might also have more specific curriculum requirements such as the ability to read blueprints, having a certain level of math proficiency, or experience on certain machines.

In general, then, the selection process is a joint one: Employers clearly have the final say, but many of them—even the large ones with their own personnel departments—rely heavily on the colleges to select the students that are appropriate for them. This may, of course, place the education providers in a difficult bind. On the one hand, they want to educate all their students and place every individual; and on the other hand, they need to be

selective about the students they recommend to employers. But whatever the discomfort involved with selection, it adds another kind of screening to the process, adding to the "high-quality equilibrium" established in Cincinnati.

We were unable to ascertain anything about one possible dimension of selecting students—that is, whether there are any patterns of discrimination against minority students, or against women in nontraditional occupations. This has been a source of concern for proponents of school-to-work programs, too, because of the possibility that discrimination in employment—particularly against black males and women in certain positions—might affect school-to-work programs as well. However, we were able to learn almost nothing about such possibilities: employers are extremely close-mouthed about their racial and gender-based hiring practices (see Grubb et al., 1992), and co-op coordinators were no more informative. It is tempting to conclude that companies using co-ops to "grow their own" employers would be unlikely to discriminate because their commitment to developing fledgling students is so strong—and because they know they will have the opportunity to observe students over a long period of time to weed out those whose performance is inadequate. In addition, several companies use co-op as a way of recruiting minorities and women, and they would be particularly unlikely to discriminate. One company, which relies solely on co-op as its campus recruiting mechanism for permanent hires, stated quite clearly its goals for diversifying their workforce:

> [Co-op] gives us the competitive edge in recruiting in that we identify these people early on, especially minorities and females. We're going to identify them in their freshmen, early sophomore year, and not wait. They're not going to be there as seniors to recruit on campus. See, I don't believe that companies can do the traditional way of recruiting anymore. You just cannot go show up on college campuses and get the best and the brightest. I believe they're out there in co-op. But you need that early identification.

However, confirming our hunch that firms in the co-op program are unlikely to discriminate would require considerably better data than we were able to obtain.

Employer Preferences: The Skills Employers Want

A revealing aspect of co-op involves the kinds of criteria employers use to select students. Over the past decade there has been extensive discussion about skills new workers will need as they enter the workplace (such as the competencies and foundation

skills outlined in SCANS, 1991). One issue is whether employers want job-specific skills and abilities such as the ability to operate particular machines, run specific software programs, or follow-firm-specific business procedures; whether they need higher-order abilities such as reasoning, problem-solving, critical thinking, and the like; or whether they are after personal competencies such as discipline, persistence, stability, or the ability to work with others. Often, there appears to be a contradiction, particularly in the sub-baccalaureate labor market. Employers hire on the basis of firm-specific skills, especially for entry-level work; but they still complain about deficiencies in higher-order ability and in personal capacities, perhaps because they find these skills inadequate when they try to promote employees up from entry-level positions (Grubb, 1996; Grubb et al., 1992).

In Cincinnati, however, a clear pattern emerged: While acknowledging that they want good academic students, employers emphasized the "softer" personal competencies more than anything. Many talked about the student's personality traits such as enthusiasm, ability to work with others, and a general sense of team work. Eagerness was more important than perfect grades. The notion that personal attributes might be lacking in a student with perfect grades was repeated by a few of the employers who stated that they would rather hire someone who is well-rounded. Typical comments included the following:

> Usually we look at a 2.8 or a 3.0 or better. But I don't necessarily go for the 4.0 student either. Those people may be absolutely the academic person, studious, but as far as people skills, the communication is weak, the personal skills are not there, and for the supervisors it does not appeal to them. They are not necessarily looking for that. It's the communication skills. So I think that's important. And if they have the 4.0 along with it, fine.

> It's basically the students' eagerness; they [the managers] don't look real hard at the background, they look at the eagerness, their adaptability, how flexible they think they can be.

While many of the companies expressed an interest in the younger, traditional college-aged student, almost all described hiring older students as well. One company representative said they like to hire students who have had careers in the military, or who had other experiences that had strengthened their commitment to work. At a small manufacturing company, the personality characteristics of older students such as dependability and stability seemed most important:

> Our greatest success has been in the two-year environment with older students that have graduated from high school, gone out in the job market, decided they didn't like what they were doing, and wanted to make a change so they're invested in their future and going to school to do that. Those folks tend to be more serious. Sometimes they're married and have a family and those kind of responsibilities. And they turn out to be very good, have good work ethics, very committed, very motivated. Sometimes, and particularly in the last few years we've noticed, the kids coming right out of high school into the two-year type of environment, two-year trade school—their work ethic has been a little bit different than we've seen in the past. It's basically a "what are you going to do for me" attitude as opposed to looking at their job as "what can I get out of this to further my career?"

Another company felt it was important to know what the student was interested in:

> Maturity, grades. We look in the first quarter because a lot of time they've been in school for a quarter or two and they've never done anything but work at McDonald's or cut grass or took odd jobs. We really look at interests to see what kind of things they do as hobbies. To see how closely what they're taking in school lines up with the kinds of things they enjoy doing.

There was also an emphasis on the student as a whole person; well-roundness was attractive to employers. A human resources representative stated the characteristics of a successful candidate:

> They generally are comfortable in different environments. Not just the shop environment, but they're comfortable in here as well. They are also academically high, not necessarily the A students, but a B or a solid C+ student . . . Attitude is important. We really look for people who can be a team player and I know that gets overworked, but what we simply mean is that they're going to have to take a little harassment, a little bit of hazing, those kind of things . . . So personality is important.

These employer preferences complement the screening criteria that the college establish. While the colleges have established GPA and/or test score requirements, and do not accept casual students into co-op, their criteria do not encompass the personal attributes that employers look for. But employers do screen for these attributes and—to the extent that they rely on co-op coordinators to help them with their screening—they communicate their preferences to the colleges as well. The result is that co-op students are likely to be screened for a broad set of competencies including basic academic abilities, specific occupational competencies taught in the college program, and the personal attributes that are so important to employers.

Creating Strong Links Between Colleges and Employers

A remarkable aspect of co-op programs is that they create strong *institutional* links between education providers and employers. In contrast, in other communities we have studied, these linkages tend to be weak, or are confined to a few particular programs in areas like engineering and health, and, in turn, result in weak connections for students to sources of employment (Grubb et al., 1992). The existence of strong relationships between employers and education providers in Cincinnati is due to a number of factors in these programs:

The Role of Co-op Coordinators

All Cincinnati colleges, regardless of whether their programs are centralized or decentralized, mandatory or optional, organize their co-op programs around coordinators whose primary responsibility is job development and placement. The relationship between coordinators and employer representatives is an important factor in setting up co-op positions. Both coordinators and employers commented on the trust and commitment involved in making placements mutually beneficial, and in monitoring students' progress. Particularly in decentralized programs, where coordinators have the opportunity to specialize in certain occupational areas, coordinators become a crucial link to particular employers.

Links to Faculty and Coursework

The degree to which instructional faculty are involved in co-op is important if it is to be truly an educational methodology; indeed, much of the criticism of work-based learning involves the question of whether the work component is relevant to the school-based curriculum, and vice versa.[17] At OCAS, since co-op is such an integrated part of the curriculum, faculty are quite aware of what students are doing on their work terms, and they feel little need for influence over the work itself. At CTC, the coordinators serve as links between program faculty and employers. As one co-op administrator mentioned,

> Our coordinators, they're faculty members but they also work closely with the teaching faculty and they're very familiar with the different programs and the curriculum requirements and changes that happen. So there is that communication and that's part of the advantage of us being in the

[17] In the language of school-to-work programs, this involves the consistency between work-based and school-based components and the strength of connecting activities.

> department as opposed to like a centralized co-op office. So we work closely with all the teaching faculty. . . . We have identified certain key skills that the students are developing. . . . [W]e have advisory committees for each program, and industry representatives to identify needs and how those skills can match with employers' needs.

At Sinclair, faculty are involved as advisors to co-op students. These select faculty are paid to oversee the co-op experience, visit the student, and assign a grade. This activity is treated as an independent study project on the part of the faculty member, and rarely involves the instructor designing the work component.

With very few exceptions, work assignments are completely in the control of the employer, with little college influence. As one employer put it,

> They're so happy to have these kids get some on-site experience that they are very good about not invading the work issues themselves.

The exception to this involvement tended to be when the school co-op coordinator thought the student was being used inappropriately—for example, doing janitorial work instead of learning about engineering. These examples were few, but both employers and educators were conscious of the possibility of upsetting the balance.

The Role of a Co-op Orientation or Professional Development Seminar

It is important to consider how students are socialized to the concept of co-op and to the fact that they represent their college when they are in the workforce. Each of the three colleges has mandatory "pre-co-op" courses that introduce important aspects of co-op to the students. Typically they include résumé writing skills, interview skills, expectations about work (of both students and employers), and career exploration.[18] One director of co-op described the seminar and the process by which students learn about jobs in the following:

> In Professional Development 1, they learn about what is available, the kinds of careers that are available with their degree. They learn about how to enter those. They learn about the components of those. So they are a little better prepared to do some of that [selection of positions] on their own. In the first quarter of the year, they have to take this course, and as part of the research in the course, they have to write their résumé and research a company. But we also have employers come in to talk with them and we

[18] The nursing program at CTC offered a different type of seminar for students; it was taken concurrently with the co-op term with the intention of helping students integrate what they were learning on the job with their coursework and intended career. Students were encouraged to reflect on their co-op experience, its relation to coursework, and implications for their career path.

> give them opportunities to talk with employers outside the employment context, more as an information gathering kind of thing. We also have them talk with alumni, find out what they're doing and how they got their jobs, what was required, all of that. So they do have quite a bit of research that they've done that way and then when an employer actually indicates interest and is coming here to interview, we make sure that all kinds of literature is available.

These seminars therefore provide an arena for students to explore workplace expectations and culture, and to orient them to the way of the world as well. For example, brochures in the Business Division at CTC offer the following "suggestions for being a successful co-op":

- Concentrate when you are given oral instructions about your work.
- After you have learned the work, think twice before asking questions; the answer may be obvious or come to you.
- When working as a newcomer, expect to do some of the less desirable chores. Your time will come to pass them on to someone else.
- Be honest about your mistakes. Take the blame when you are responsible and profit from these mistakes. Accept constructive criticism.
- Express appreciation for courtesies and considerations shown to you. Do not let those with whom you work get the impression that you are a complainer.
- Develop a reputation for good judgment. Remain open-minded and respect new opinions.
- Learn the names of the people with whom you are working. At first, call all people in authority positions "Mr." or "Mrs." rather than by their first names. Let them tell you their preference as to how they would like to be addressed.
- Appreciate the friendliness of others, but be careful not to indulge in gossip, or to be drawn into cliques or department politics.
- Know your company's absence policy.

The brochure also lists several "reasons for failure":

- Don't be late or absent.
- Don't embarrass your supervisor by appearing idle in front of other workers and in the presence of "higher-ups."

- Don't go over your supervisor's head with requests, complaints, or suggestions.
- Dress according to the way other people dress in that organization. Avoid drawing attention to yourself by wearing eccentric clothes or displaying eccentric mannerisms.
- Don't register impatience if you are not given new work as fast as you are able to handle it.

These suggestions are the school's attempt to bridge the gap between student culture and workplace expectations, while the co-op opportunities themselves provide important experiences for students to learn about workplace behaviors and to develop a "work ethic."

The Nature of the "High-Quality Equilibrium"

An interesting and unexpected finding was the existence of unspoken agreements between the employers and the education providers that each will provide a contribution to co-op education of high quality—that companies will get well-prepared, hard-working students, and that co-op students will have access to real learning situations on the job. In essence, there is a "high-quality equilibrium" in which each party's expectations of the other is being met—and a recognition that if either side neglects this agreement and allows quality to slide, the other would follow.[19] For example, if the quality of jobs decreased—if students were doing fairly menial tasks—fewer able students would go into those programs that require co-op; if the quality of students dropped, employers would seek other means for meeting their labor needs. While the high-quality equilibrium is unstated, both employers and educators are conscious of it. For example, employers were adamant that they hire co-op students because they get high-quality work out of them. As one employer said,

> We just don't take what isn't a good student. So I guess through years of experience of working with us they [the college] know that we're not going to take a warm body, that we'd do without.

Another individual acknowledged that she has seen companies use co-ops to do low-level work, but to the detriment of the program. Her previous firm used co-op students to make copies of blue prints, rather than learn to draw them; as a result, the quality of student

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[19] See also the discussion of the high-skills equilibrium by Finegold and Soskice (1988).

decreased. When she was promoted and tried to improve the program, it took some convincing to get good students back.

Another employer attributed the high-quality equilibrium to both the students and the college program itself, though admitting that they would accept particularly outstanding students even from mediocre programs:

> It's the quality of the students coming out and it's also the quality of the co-op program at that college, it really is. Many of the reasons you're asking, "why do I select the universities I do," it's the same reason for saying no. Oh yes, we might try some schools here and there, different ones, and we might have a student, and the student is very good and the co-op program is very bad, but they were referred for a reason. The students are good and we won't say well just no, because the program is not any good.

Once the high-quality equilibrium is established, it creates its own incentives for each side to maintain quality; otherwise students will not enroll and employers will not provide jobs. A co-op administrator described the motivation for employers to offer decent jobs:

> I inform [employers] if they have a low campus image and nobody wants to interview with their company—because students bring this back, too, you know. There's nothing that can kill a program quicker than students coming back and complaining about their co-op job, so the students really talk to one another about these things—how much they make, what they're doing, and so forth. I mean, there's a lot of buzz on campus about different businesses and where the "good" jobs are. So employers need to know that.

At the same time, the educational institutions have to be sure to send students appropriate for the kind of work involved, rather than "clunkers":

> If [employers] got clunkers every time, if they got somebody who couldn't do the job or learn the job—they would, of course, generally be able to deal with that on a once a year basis [but they wouldn't put up with it often]. If a coordinator doesn't screen an applicant sufficiently for the job—I mean, if you put a student out on a job, for example, in drafting or in CAD, and the student hates offices and wants to be in a factory or outside—that is not [going to work well]. So there's a certain amount of common sense to make sure that the situation works right.

These co-op programs therefore screen both students and jobs so that able students are matched with promising jobs and so both students and employers have sufficient information and there is an appropriate match.

The high-quality equilibrium in Cincinnati is almost surely a factor in the popularity and longevity of co-op education. Elsewhere in the education and training system, various "low-quality equilibria" have evolved, in which jobs of low quality, pay, and status are matched with students or clients with few skills, little education, and insubstantial experience—for example, in the work experience programs that proliferated in high schools during the 1970s; in the job training programs funded by the Job Training Partnership Act (JTPA) and by welfare-to-work programs; and in the Department of Labor's Employment Service. These are low-status, marginal programs that—whatever benefits they may generate for individuals in them—would never be promoted among employers in the ways that the Cincinnati co-op programs are. The obvious implication is that school-to-work programs also need to establish mechanisms to ensure a high-quality equilibrium.

Evaluation of Co-op and the Availability of Data

Assessment issues in cooperative education are often overlooked.[20] Evaluation includes examining the effectiveness of overall programs, as well as studying the effects of these programs and experiences on the development of the students/workers.

The procedures for evaluating co-op programs in Cincinnati are fairly consistent. Typically, employers complete evaluation forms provided by the educational institution concerning individual students. At some companies, an in-house evaluation is conducted in addition to the one the school requires. The college representative use these evaluations to assign the student credit for their co-op term, and in some cases to assign a grade. Employers often use the evaluation to determine if they should ask the student back for another work term.

At one of the larger companies, which intends to hire full-time permanent employees from their co-op pool, the evaluation is more extensive:

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[20] After rapid expansion of cooperative education, questions of effectiveness, relevance, and overall definition came to the forefront. Some of these pressing questions were asked in the 1978 monograph, *Developing and Expanding Cooperative Education* (Wilson, 1978), including, What is cooperative education really? How is a viable program of cooperative education designed and implemented? What are the functions and roles of a co-op coordinator? Under what conditions, if at all, is degree credit for co-op justified? How does co-op relate to other campus-based forms of nontraditional or experiential education? These questions were intended to drive program improvement efforts, and to inspire dialogue about cooperative education. However, there has been relatively little sophisticated evaluation of co-op programs.

> When a student comes to us and they're in their first assignment we do a mid-term evaluation. And it's discussed with the supervisor and the student, and that gives the student a chance to change or alter performance of some of the things they're doing. And at the end of the term, there is an informal evaluation. It's a review with the student and it is signed by the real manager and the vice president of operations so he or she can see the type or level of the work assignments, and the type of students we have. And we have on that form, "does this person have potential for full-time employment?" And you'll say "too soon to evaluate, yes or no." And so I can monitor. If after the second assignment or third, it's saying "too soon to evaluate," then I know I've got to go in there and find out what's going on because really you should be able to know after two assignments. And then that form, of course, is returned to the college and then each term thereafter they're evaluated.

Another company's representative stressed that the evaluation process focuses on the student's experience as much as on what the company gains:

> At the conclusion of each term, it's a sit-down session. Some of the programs here they ask the co-ops to keep a diary and do a report. And so it's just a give and take back and forth. But it's done by the manager. They sit down with the manager. And then our department [human resources] does an exit interview as well. And the purpose of the exit interview is an outsider coming in and saying, "How was your experience? Do you know what you're going to do the next time? Or is the program right? Are things going well? What are some of your successes? and things like that." So it's a two-step process, done by the manager and then done as an exit interview type thing by our department.

How employers evaluate the overall effectiveness of the co-op program is less clear. For the most part, the companies base their continued use of co-ops on anecdotal history and on general good feelings. They can identify clear benefits to having co-ops, as we review in the next section, but rarely have data to back up their statements. One exception is a large firm with an extensive program and a long history of hiring co-op students. They have conducted in-depth cost-benefit analyses, with the assistance of one of the local co-op coordinators, to determine the value of their program. They found that co-ops cost them money in the first term, but pay for themselves after the second term. In addition, there are considerable cost savings to using co-op as a recruiting mechanism, and co-op students who come to work for the company after graduation tend to be more productive and more content employees. In eight of the eleven reporting organizations surveyed for their study, co-op education was found to be cost effective at the student employment level. In addition, the report shows co-op students to be 73% more cost effective over the first 21 months of full-time employment (Abel & Love, 1988).

Many of the employers and co-op coordinators expressed an interest in additional evaluation and data collection. Yet resources of time and money have precluded them from developing better evaluations. One company found that having preliminary data from an evaluation saved their program when the firm went through dramatic changes:

> We should keep records. I mean you should, every five years or so evaluate the program and see where you are. But what happened, [our company] went through a rightsizing. Rightsizing is not getting rid of people, it's making sure you're doing the right things and doing them right. And we had to make presentations, and we did eliminate some of the activities where we felt we could be doing something else. When I made that presentation for all this, I wanted to give them statistics and the questions they were asking is "how many people have you hired in the last 10 years?" "What is the retention of those people?" We had all that in the database, and you can just plug it in. And that was very important in keeping the program, that we had good data.

Like employers, the colleges tended not to have formal evaluation mechanisms in place. While basic statistics are kept regarding the number of students and employers involved each year, very little data is collected beyond that. There is certainly an interest in knowing more about their students' experience, as well as how to improve their programs, but resources are unavailable to answer those questions. The lack of adequate information about these co-op programs reflects the weak state of institutional research in community colleges generally.

Potential State and Federal Roles

In the debates about work-based learning, it has been unclear what role governments can play. The School-to-Work Opportunities Act provides some federal funding—admittedly of trivial amounts—to support various costs of such programs, but it is unclear what the priorities are for such spending. In Cincinnati, co-op programs have developed without specific governmental funding; state support through normal state aid to communities colleges is crucial to maintaining the college component of co-op programs and supporting the co-op coordinators, but there has been no special purpose funding analogous to that provided by the School-to-Work Opportunities Act.

What do employers want from the state or federal government to encourage them to hire co-ops? The employers in Cincinnati tended to mention activities that included

promotion and advertising, wage subsidies, and special categorization for employee status.[21]

A number of employers suggested the state take on a greater role in promoting the benefits of co-op to employers and colleges. Employers and educators alike stressed the importance of getting the word out about co-op; as one employer commented about his priorities:

> I have probably different wants and desires than the colleges do. I want to get co-op publicized. I mean I want it to be a way of life in everything we do. I'm not asking for money because we don't need the money to run the program at [my company]. That's not what we're looking for. I just want it to get the recognition of how important it is, give us a chance to get out there and show them. And I strongly support the colleges. I want to make sure those colleges have enough money for enough professors so that the students can get all the classes they need. And that's what bothers me is that if the money is not there, then they cannot have full-time, year-round school so that students can get their college classes in the summer time.

In terms of funding for co-op programs, state support for the community college portion seems to be adequate; at least, there were few complaints about insufficient funding. However, the notion of providing some funding for the *employer* component—either directly, or through a wage subsidy—was raised consistently, though there were two distinct camps of employers. Some were not interested in wage subsidies, or said that subsidies would have little effect on their current co-op programs; while others were eager to have this incentive. Those on the side of more government funding included a small employer who thought that his company would hire more co-ops if there were financial incentives to do so, as well as a large company which experienced a significant reduction in their workforce due to corporate downsizing—suggesting that size is not the only distinguishing feature of those wanting more financial incentives. (The latter company does not hire co-ops as permanent employees anymore upon graduation, and thus uses co-ops as cost-efficient labor.) The former company felt that, as a small firm, they might hire more co-ops if there were financial incentives to do so:

> It would be great to see some tax abatement or something like that. Again for a small company particularly, I think it would encourage us to use it

[21] These responses are consistent with the findings of Bragg et al. (1995), who determined from a survey of co-op programs that they would recommend more incentives for employers to participate and increased promotion of work-based education. The number-one recommendation in this survey was, not surprisingly, the call for more resources for two-year colleges—an issue that is less serious in Cincinnati because of the availability of state funding.

> more. And if it helps offset some costs, we might be able to use more co-ops.

One employer suggested a subsidy for students rather than companies, in essence a loan forgiveness program for students who co-op:

> Don't pay us, pay the student. I'm not looking for money specifically but if we all had to pay let's say four or five dollars instead of seven or whatever it is, the government would pick up the difference; it would be easier for us to have more co-op positions. For instance, if the student came in with their own training dollars from the government. In other words, I don't want to be involved necessarily [in a] "give it to us, we give it to them" type of thing but rather the government helps the student. And I think the government could look at ways like that to help themselves as opposed to "we'll loan it to you when you come back later" type thing. We hope that certainly the government could help some colleges and universities, I think, in terms of helping their labs; they really could have more up-to-date equipment. Right now, much of it falls on private industry [to provide equipment].

One particular aspect of funding mentioned by several educators (not employers) involves federal funding for students most in need—those eligible for job training programs provided by the Job Training Partnership Act (JTPA) and welfare programs. In the past, such individuals have been eligible for federal grants and loans, especially Pell grants for low-income students, enabling them to enroll in postsecondary institutions with a combination of job training funds, student grants, and the regular state subsidies to postsecondary education. However, in an effort to reduce what some have interpreted as "double-dipping," Congress proposed eliminating job training clients from the Pell grant program. This caused one co-op representative to complain:

> I still think the number one problem with co-op, not only the state, but the federal, is the students who are on welfare, AFDC, Pell grants. We're fighting an argument now with the federal government whether a student is a full-time student if they're on a Pell grant or not. I think it would be nice if the federal government and the state government encouraged students to co-op and not discouraged them. And they discourage them by wanting to cut aid, by wanting to take them off grants. And it tells the student "I don't really want you to co-op." Well it continues to make that student a tax liability instead of a tax asset. . . . I think that the state and the federal government makes it too difficult for the students to co-op.

In general, however, there do not seem to be large numbers of JTPA or welfare clients in co-op programs, and no systematic effort to enroll them;[22] we suspect that a few such

[22] In other communities we have examined, employers have been suspicious of job training programs because they include many undereducated and unmotivated individuals (Grubb et al., 1992). We suspect that

individuals find their way into co-op through the mechanism known as individual referral, where clients can chose their own education or training program.

A third government role that employers mentioned involved the re-employment status of co-op students. Ohio does not consider students working while enrolled, whether in an alternating or parallel program, to be employees eligible for unemployment compensation or workman's compensation. This fact was cited by employers and co-op coordinators alike as helping make the programs work so well. As one manager stated,

> What the state does for us right now is, they do not consider co-ops employees. So if we or the co-op terminate the employment relationship, we're not liable for unemployment. That's a big deal. A change in that would change our attitude towards our co-op program.

That is, employers and educators alike want to maintain the flexibility of co-op as something different from a conventional employment relationship, with fewer penalties if a co-op student does not work out. This reflects in part the view of co-op as a "try-out" relationship, in which students and employers alike are testing their preferences and the match between employer and employee.

While neither employers nor educators consistently cited any other ways in which governments might help foster co-op programs, it is clear that there are substantial resources required to operate successful programs. The colleges need a staff of co-op coordinators and—in states that do not continue to support co-op students thorough normal state aid—these would need to be funded from special monies. In addition, the costs of smaller class sizes, sometimes necessary for students on alternating programs, and of special seminars need to be considered. Many employers in Cincinnati are willing to bear the costs of their own coordinators, since they recognize the long-term benefits of "growing their own" employees and of recruiting high-ability workers, but in the short run, many firms in other regions of the country may not be persuaded of the need for such resources—particularly for small companies that rarely hire, or in economic recessions, or in regions of the country with depressed economic conditions. Therefore the comments of Cincinnati providers about the role of governments in fostering work-based learning might not be applicable in other places which lack its long tradition of co-op education.

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any effort to enroll large numbers of job training clients in co-op programs might cause resistance from employers.

THE BENEFITS OF COOPERATIVE EDUCATION

Cooperative education has been in existence for over 87 years, and about one-third of the nearly 3,000 colleges and universities nationwide have co-op programs (Wooldridge, 1987). While many schools offer some form of co-op, however, most have very small programs with few students (Stern et al., 1995) and, because of this, most educational institutions evidently have not found it possible or worthwhile to expand co-op programs. Nevertheless, it is clear that there can be numerous benefits. A 1991 report from the U.S. General Accounting Office concluded that high-quality co-op education can benefit both students and employers: Students gained motivation through seeing the relevance of education to work and were therefore more likely to stay in school. They also "learn employability skills, acquire marketable skills in their career field, and earn wages" (p. 4). Employers reported that co-op programs saved them money by providing a pool of future employees and thus reducing recruitment costs. These benefits are echoed throughout the literature; for example, the *Journal of Cooperative Education* has published more than 34 articles between 1964 and 1982 describing the benefits.

In Cincinnati, employers and educators alike confirm a variety of benefits, for students, for employers, and for the educational institutions themselves. In addition, the benefits of co-op education are all the more powerful given the nature of the sub-baccalaureate labor market for which two-year colleges prepare students.

However, a caveat is necessary. As we mentioned above, there is virtually no data about the effects of co-op programs on completion of educational programs, or later placement rates in employment, or subsequent patterns of promotion and earnings. While the benefits of co-op programs are consistently mentioned by educators and employers, their statements are entirely anecdotal, and because of their participation in co-op, they are not disinterested observers.[23] It is important to be careful, therefore, in interpreting the testimonials presented in this section.

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[23] It has been difficult to find statistical evidence of the effectiveness of co-op education; see, for example, Stern, Finkelstein, Urquiloa, and Cagampang (forthcoming). A recent review of the earnings effects by Somers (1994) found most studies to be poorly controlled, and that many of the studies found co-op to have no effect on earnings; one of the best-controlled studies, of graduates from Michigan State engineering programs, found an effect on earnings of only 1.9%. All of the studies cited were from four-year colleges, however, and most of them examined earnings directly after college. Wessels and Pumphrey (1995)

Student Benefits

The benefits for students fall into three categories: (1) gaining useful experience and becoming familiar with the requirements of working; (2) career placement; and (3) earning money for college.

Gaining Experience about the Workplace

There was considerable agreement that gaining skills and becoming familiar with work was the most valuable benefit of co-op. Students, employers, and education coordinators agreed as well that it is useful for students to get out of their school environments in order to put their learning in context:

> It's something other than sitting in a classroom or even in a lab; it's the real world. You drew it, you just put it together, and it still doesn't work. But we're on a deadline, we've got to have this done because we've got a customer that's screaming for it, you know. So here is the real world.

> Students seem to appreciate their programs more when they go back into the classroom; they understand things more.

The argument that co-op is a valuable pedagogy in its own right emerged again and again. One of the co-op coordinators expressed his college's philosophy as follows:

> Number one, we think that cooperative education is a superior form of education in that it not only teaches students about the theory of vocational or what they're studying, but it also teaches them the practical application of that. Therefore, they can apply the theory that they're learning in the classroom in their minds a lot more clearly. They understand why they're studying structures or why they're studying a subject because they've seen how it's used in industry.

Employers also emphasized that students benefit from the real-world experience of co-op:

> Well, they get to apply what they've learned in college. They get to grow up. It's experience and everybody says it's experience they get in the real world because there is just no match for it. And when the time comes to graduate, I think they're going to know what they want to do. And if they

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reviewed a number of studies finding little influence of co-op on the length of initial job search and advancement. They then examined the employment of graduates of community colleges in the North Carolina system and found that individuals placed with their co-op employers have a reduced search time for their first job, and that co-op graduates report more job advancements, suggesting that the benefits of co-op may emerge only after a number of years. The students from these community college co-op programs are also more likely to report that employers are making use of the skills they learned in college. Overall, however, the empirical literature that exists is quite mixed in its support for the effects of co-op.

> didn't co-op, they wouldn't. And they get a chance to have happy times, disappointing times, frustrating times, and that's just a part of working.

A co-op coordinator at CTC explained the importance of gaining experience:

> It's like practice. You get a chance to do a job . . . That's the neat thing about co-op because you're not sure and you get to go out and you try it out and you get to see what those people do, day in and day out, and you get to say "yes this is what I want to do the rest of my life" or "no, it's not really what I want to do the rest of my life," so you get an opportunity to make a change without a lot of investment into it.

Career Placement and Guidance

For many students, co-op is the most successful job search strategy. As one employer stated it,

> After they graduated, most of the time they have a job already there and they don't have to do anything.

At the companies interviewed, with the exception of one with a general hiring freeze, between 60 to 90% of the co-ops are offered full-time employment upon graduation. As one of the coordinators stated,

> One of the worst things in the world to do is to go out and look for a job. I mean you get to go out and pour your soul out to somebody you don't even know and get to beg them for work. Twenty-five, thirty, thirty-five percent of the time you worked at a company and they say "why don't you come to work for me." The job is sitting there waiting for you. You don't have to go out and look for a job.

Even if students do not get a job with the firm for which they co-oped, the work experience is valuable to their efforts to find other work—particularly given the importance of experience as a job qualification in the sub-baccalaureate labor market. As one co-op coordinator declared,

> Another strong reason [for co-op] is it will enhance your résumé. . . . A co-op student, even if they do entry-level work, can say "I went to work in a company just like yours. I went at seven thirty in the morning and I left at five o'clock in the afternoon. I did the bookkeeping or I did the computer work or I did the chef work. I saw what the other people in the organization have done. I know that if I'm a chef student, that the time between November 1st and January 15th is like a zoo. I know for accounting people it gets crazy after the first of the year. I know how busy landscape horticulture is in June and I know the long hours it takes and the hard work it takes." Now the employer is going to be able to look at that

> student and say, "he may not know exactly what my company is about, but he or she knows what it takes to get the job done." . . . So instead of getting just theoretical work that a student gets in a classroom, and some lab work that a student gets in a classroom, they have some practical experience. So instead of just opening the door of opportunity a little bit, you open it much further. And we've seen associate students win over baccalaureate students because they have the practical experience that the baccalaureate student doesn't have.

For the same reasons, co-op experience puts students in the nursing program at CTC ahead of other nursing graduates who have had only clinical experiences:

> Well, the fact that they can have real live work experience in their résumé, maybe even some experience in a specialty area, gives them an advantage. I had two students from the group that just graduated that have been hired into Christ Hospital's intensive care training area, which would not have been possible for any other kind of a new grad. I've had two of them go directly in ORs based on the training that they received in their co-op experience. So it certainly gives them an advantage in the job market above other new graduates who don't have that.

For many students, then, a co-op program is a direct way into employment, smoothing the transition from school to work precisely as the school-to-work programs envision. But an equally valuable aspect for some students is finding out what they *don't* want to do. One employer after another, as well as co-op coordinators at the schools, emphasized the point that students benefit greatly through co-op even if what they learn is that they are in the wrong field. As one coordinator stated, "They haven't spent five years in engineering school to wake up one day to find out they don't like the work." One manager echoed this sentiment:

> It's a real life application of their academic work. It enhances what they do in the classroom and it helps them really affirm and confirm that they want to be in that area of work. . . . I interviewed a co-op last week for an engineering job; he was an electrical engineer, one of them from UC. He was going to work in the lab here. It's out in the shop, it's dirty, it's a place where you wear blue jeans because you're going to have to walk out and look at the machines. It was really obvious to me as soon as he walked out there he cringed. And in fact he said "I've never been in this kind of an environment." And I said "do you think you'd be comfortable here?" And of course he said "oh yes," because he was looking for a job. But the body language was "oh no." I think he felt uncomfortable that his shoes were touching the floor. But that's fine. And in the same round of co-ops we had another guy who I thought was going to pull off his suit coat and get to work. He just loved it and had worked in a similar environment as a summer job when he was in high school. So he was real comfortable with it. But students need to know that. That doesn't make the fellow who

> doesn't want to work in the dirty environment a bad guy. He just needs to find his right niche.

Wherein guidance and counseling is often inadequate at this educational level, the co-op programs in Cincinnati provide information about work in an experience-based form that makes it all the more real, that provides students a better sense of the world of work and the nature of jobs available.

Earning Money

Many students in co-op programs are able to complete college without accumulating enormous debt. The colleges are proud of this fact, and use it to recruit students who might not otherwise be able to finance their education. One coordinator reemphasized this point:

> You get paid to do it. If you're a co-op student and you're smart enough not to go out and buy a brand new automobile or a new apartment or new clothes or whatever, if you're smart enough to take that check you get every two weeks and reinvest it in your education, when you graduate from CTC or you graduate from whatever institution, you don't have that big bill. So when you start getting more dollars than six, seven, eight, nine dollars an hour, you get to invest it in the new car or the new apartment. And I think that's a real plus for a young student not to have to face those bills when they're done.

Another coordinator stressed that earning money is a special benefit to poorer students:

> They're given a tremendous opportunity to pay for their education. We think for an indigent student, if they could get a loan for the first year, the chances of them being able to pay off the rest of their education, cooperative education is excellent. We don't tout that so much because students do with their money whatever they want to do with it. You do pay taxes out of co-op income. Really we'd like to work with the government in that regard too in some ways. We haven't made any inroads. But they normally can save enough money for college. Many save enough money for both college and living expenses.

According to one of the students interviewed, covering college costs has been an additional benefit to her participation:

> For me, another benefit is that I pay for all my college tuition. So this is a way for me to finance my tuition. Every other quarter I work full-time, otherwise I would be up to my ears in loans. So there are lots of benefits,

> foremost being experience and exposure, but the money and making contacts, you can't get that just by going to school every quarter.

Employer Benefits

A recent monograph by Lynn and Wills (1994) reported on employer involvement in school-to-work programs. While they reported that many of the employers recognized benefits to their participation with schools, the overall tone was less optimistic. The reaction from employers in Cincinnati to questions about their participation in the co-op programs was quite different: There was overwhelming support for co-op, and every employer could identify clear benefits to his or her organization, the students, and the educational institutions involved. In fact, employers were much more articulate about the benefits of co-op than any other group. They reported consistent benefits in three areas: (1) co-op as a recruitment tool for future hiring; (2) co-op students as cost-effective labor; and (3) the productivity benefits of having motivated short-term workers. One employer's comments covered the three benefits well:

> Well, first of all it's cost effective and it truly is. People don't realize that. They don't necessarily have to come work with us. It's still cost effective because of the work and the skill level that's being applied. It avoids the hiring mistakes for us because you know you've got two years and you really do know an awful lot about the student. The student knows about us and it's so costly to make hiring mistakes. So we feel that is one of the major benefits. I did a small study—there is a greater retention rate of the former co-op versus a new hire . . . And so we only hire our co-ops and I can see the difference, just outstanding young people. It also gives us the competitive edge in recruiting—that we identify these people early on, especially minorities and females. We're going to identify them in their freshmen, early sophomore year and not wait. They're not going to be there when they're seniors and companies are recruiting on campus.

Recruitment and "Growing Your Own" Employees

The extent to which employers use co-op programs as a recruiting tool for new employees is additional evidence of how widespread co-op programs are. Of the nine employers interviewed in-depth, only one has not been hiring their co-ops upon graduation; this employer has been downsizing in recent years and has a hiring freeze. The other eight employers claimed that from 50 to 90% of co-op students are offered permanent employment. All of the companies cited recruitment of future employees as a major reason they participate in co-op, as well as a major benefit for them. Many of the companies

reported a policy of not hiring students until they complete their program; they stated that they did not want to short-change the student in the long run.

One of the overriding themes among employers was the notion of "growing one's own employees." All of the employers interviewed look at their co-ops first for permanent hires, provided the student has completed the program. As one representative summed it up,

> It's an opportunity to grow new people into the business. I see that as probably the biggest benefit.

Another representative said that her company relies heavily on hiring co-ops because it is impossible to learn skills specific to their company in school.

> For us it's ideal. We manufacture conveyors. An engineering student coming out of a two- or four-year degree program is not going to be exposed to how conveyors work or how to design conveyors. Even an engineer with many years of experience can't just jump in to a job. . . . We bring a student in and we put them to real work. I've had people with associate degrees come right out and they are design-level engineers, sharp and ready to roll and yes, we'd automatically love to have them, to extend an offer and hire them in full-time.

The idea of grooming employees was echoed by many employers. They emphasized that the considerable investment on both their part and that of the student is rewarded when the match is made:

> Currently on staff, probably a third of the people we have come through the session [the co-op program]. Generally, if we work with a co-op all the way through, we hope there's an opportunity for him when he's done because we've invested a lot in him. He's invested a lot in us and we also have a good look at each other. So if we've got an opportunity, we try to bring co-ops on full-time.

At many firms, the personnel representative stressed that co-ops are an excellent source for recruiting full-time workers:

> We tell co-op students we're not hiring you because we're nice people and we're good corporate citizens and all of that. We're hiring you because we want people coming out of this program to become future employees. And we want work done in the interim. They come in and they do productive work. They earn their work. And the biggest thing is that it's a tremendous, tremendous recruiting tool and it's probably the best that you've got because you're not going on, well, I *think* they'll be a hard worker or I *think* they'll be able to learn and adjust. You *know* because

> they've been there. As long as the experiences that they get as a co-op are close enough to what they're going to be doing. So my dream is never to have to hire anybody anymore. My dream is to go out and help the schools recruit students so they can put them in our co-op program and when they get out we hire them full-time.

Another company, which has been involved with cooperative education since its inception, has the goal of offering every co-op student a job at graduation. As the representative stated,

> Our co-ops and interns are hired permanently once they graduate, providing that we have the opening and they've done a good job. I don't have a percentage (of how many actually are hired) to share with you. It's not as high recently because of [the decline of] aerospace. We did have some layoffs in aerospace. When we laid off, we have a commitment: We will never lay off a co-op and it's just something we started. It's a tradition; we'll never do it. So what we did was, we displaced them into other areas of the company and they were not hired on because they obviously didn't want that. It wasn't the right fit, so our statistics for the past six, seven years have been very much down.

One small company said that they use the co-op program as a form of recruitment: They cannot compete with the larger companies' pay rates, but they can provide students opportunities to gain experience that they would be unable to obtain from other firms. In their pitch to students, they stress,

> You're not going to stand in the blue print room and make copies all day. We're going to teach you how to be an engineer or be a designer. You're going to get some hands-on experience.

Cost-Effective Labor

While some companies use co-ops as a hiring mechanism, other firms have a much more pressing need for labor, and they viewed co-op students as a source of cost-effective labor. In fact, the co-op staff at Sinclair, where most of the co-ops are parallel, thought that the employers who hire their students participated primarily for their productivity, as opposed to the longer-term purpose of "growing one's own" employees.

Most employers were adamant that real work was being performed. One employer admitted that the co-op program was a cheap form of labor:

> In fact for us, and I guess this is a rather crude way of putting it, it's an inexpensive way for us to get very good help. If we had to hire from the outside . . . it costs three times the amount to subcontract.

When asked if co-ops were costly, one employer replied,

> No, because they perform work. They do perform legitimate work and it's not busy work. It's work that if they didn't do it, we'd have to hire somebody in to do it.

Another employer commented on the benefit of having a cyclical employee:

> For us, it is a very cost-effective way, plus if they keep coming back, we already have knowledge invested in this person.

Both employers and educators stressed that co-op students are more motivated than other potential employees. As the Sinclair brochure claims,

> Cooperative education is the bridge between the classroom and the workplace. Co-op students offer dedication and enthusiasm as well as a commitment to growth in a chosen career field.

Employers often remarked that hiring students for short-term work was more beneficial than hiring someone off the street. With a student, they knew there was a commitment to learn and to continue in that field. Numerous employers also mentioned the added benefit of having young, enthusiastic workers around:

> The youthful ideas, I think, are neat for us. They show a lot of initiative and a lot of creativity. . . . Our people get an extreme benefit from showing someone their trade and how to do it. And you get people who want to work.

> There is a component in the business of having youth involved that brings a vitality to the organization. And some of it is stupid, blind enthusiasm; it's nice to be around [that] once in a while.

Another employer emphasized that co-ops were more than cheap labor:

> On paper, the co-op is probably $5/hour cheaper to hire. They bring in much more than temporary help do in their eagerness and flexibility.

This point was echoed by other employers who liked the freshness of students working with their permanent employees. Many thought that it rejuvenated older workers, and that the opportunity to "teach" others was good for all involved. In addition, the students are monitored by school officials, like co-op coordinators, while on their work-based

assignments. The coordinators typically make one or two site visits to the employer in order to check on the student, and are available to handle any disciplinary matters that the employer wants assistance with.

Benefits to Educational Institutions

The colleges involved in cooperative education clearly recognized the benefits to themselves as institutions as well. Their responses were quite consistent: Because of co-op programs, colleges are able to provide better overall educational experiences to students; co-op helps to strengthen relationships between colleges and employers; and faculty are able to stay current with changes in their field.

Providing Better Education

A very real benefit to the educational institutions is that co-op contributes greatly to students' learning. This was clearly stated by all of the coordinators and employers interviewed. As the co-op director at one of the colleges stated, "My school believes in it as a methodology of education." Co-op coordinators emphasized that work-based learning also helped students understand better the value of their coursework. Employers almost always receive copies of students' grades, thus reinforcing the importance of good grades.

Offering strong co-op programs also adds to an institution's distinctiveness. The college representatives were aware of this marketing factor:

> It makes us unique. I think it validates what we do. I think it would be real hard to teach a history course at the University of Cincinnati and never know whether your students use it or not. But for us we get to see upfront whether what we're teaching the kids is working or not working.

The colleges claimed very high placement rates for their graduates, which they attributed to the co-op program. One of the employers felt the schools' recruitment efforts are enhanced by the existence of co-op:

> They are able to recruit students who understand that they'll get a job at the end of their college experience versus how many college students are out there, particularly when the economy is like it is right now, how many are out there flipping hamburgers or whatever it takes.

Strengthening Relationships with Employers

The development of partnerships was mentioned by employers and college representatives as being an important benefit of co-op programs. An employer representative who has worked with co-ops for over twenty years stated firmly,

> Well, if it hasn't been too obvious, I guess it's from my own personal standpoint, I think it's [co-op] the greatest thing since sliced bread . . . But the key thing and I think it's come through, but the key thing is the developing of the partnerships. It's just like a relationship with a position. If you only go once every twelve years, you may not know the history and how things are developed and you may want to start out with the physical and different things like that. But we strive for developing partnerships. And partnerships mean, you need some help, call us, we'll see what we can do. We need some help, we'll call you, type of thing.

The schools agreed:

> It keep us in touch with industry. We have six people here on the payroll not counting me that spend all their time out in industry. We knew when [a particular company] was about to downsize because of what we heard on the streets and what we heard sitting in people's offices.

An employer stated additional benefits to educational institutions of their relationship:

> Well, they have an opportunity, with us anyway, to get more involved and find out what we're doing. In the middle of August we have a team coming down to [one of the plants] to meet with our supervisors . . . The deans are coming and they get to sit there with the supervisors and say, you know, "what should we be doing?" This is what we need. So more interaction. Also they're going to learn some state-of-the-art technology

Keeping Curriculum Up-to-Date

There are also benefits associated with keeping instructors current in the field through their contacts with employers. As one company representative stated,

> To the colleges, I think the number one [benefit] is that they can come into the company and see what we are doing and they can keep up with it. And keep their college at the leading edge of the universities in the selection that the students make as to where they want to pursue an education. I think, too, the professors, it has helped them. But I think the professors, just from my experience, tend to not be as realistic as to what the real world is all about. When I went to school and graduated from my undergraduate degree, they filled my head with, you'll get this wonderful job. They fill the students with ideas that are not true and that don't happen. And I think this has given them, from the students I see today, they are more realistic than I was. I think the professors have come down a little bit off of their,

> those that are involved in the co-op program, off of their idealistic pedestal, if you will. I think that's a definite plus.

Perhaps the most dramatic benefit to the colleges involved in co-op is eliminating the gulf between their institutions and the employers who will hire their students. In Cincinnati, employers are almost uniformly knowledgeable about local education providers, and generally supportive of them. In contrast, in other local labor markets, employers are generally unfamiliar with local schools and colleges, and often dismissive of their quality (Grubb, 1996; Grubb et al., 1992; Useem, 1986). There are, to be sure, exceptions in occupational areas (like engineering) where employers have set up special working relations with specific departments, and in some occupational areas like health where licensing requirements force employers and providers to interact routinely. In all these cases, the crucial difference between knowledge and ignorance, support and hostility, is the regular contact between employers and providers, focusing on a task—the education of well-prepared students—that benefits employers and educators alike. While there are other ways to increase this kind of contact, co-op programs as they have been practiced in Cincinnati are some of the best ways to enhance such contact.

The Nature of the Sub-Baccalaureate Labor Market and the Advantages of Co-op

The educational institutions we examined, like community colleges across the country, prepare their students for what we call the sub-baccalaureate labor market—the market for individuals with at least a high school degree but less than a baccalaureate degree. This labor market has several qualities that distinguish it from the professional labor market for those with baccalaureate and postsecondary degrees, on the one hand, and the market for completely unskilled jobs (including those filled by high school dropouts), on the other (Grubb, 1995, 1996; Grubb et al., 1992). Within this labor market, co-op education provides special benefits.

One distinguishing feature is that the sub-baccalaureate labor market is almost entirely local. In their search for employees, firms generally advertise locally; if they establish relations with any education providers, they do so with community colleges or area vocational schools within the same community. Community colleges, technical institutes, and area vocational schools target local employers as well, and deans and

instructors report that students search for employment almost exclusively within the local community. The only exceptions appeared in cases of highly specialized skills (like those involved in the production of lasers), or in a very few cases where employers (usually large firms) have established good working relations with distant community colleges.

One obvious consequence is that the local relationship between employers and educational institutions is crucial: If students cannot find employment related to their education within the community, they are unlikely to benefit from their education by moving elsewhere. For several reasons, however, this relationship is often quite weak. For example, the ways in which community colleges might establish better working relationships with employers are often quite ineffective. In many cases, advisory committees meet infrequently and provide very little information to educators. Many placement offices are understaffed, and concentrate on part-time "stay-in-school" jobs rather than linking occupational programs with employers. Placement by individual instructors does take place, but is sporadic and uneven. Student follow-up and tracking mechanisms, which can provide information to assess the strengths and weaknesses of occupational programs, are poorly developed in most institutions, so that most instructors and administrators have no idea where their students go. And while licensing requirements help establish congruence between employers and providers, they are quite rare outside of health occupations.

However, co-op programs provide the kind of regular interaction between education providers and employers that contribute to stronger ties. In striking contrast to some other labor markets, where employers are generally unfamiliar with local schools and colleges, virtually every employer in Cincinnati was knowledgeable both about the co-op programs and about the educational institutions in the community.[24]

Employers in Cincinnati commented on the local character of searching for and hiring new employees. Indeed, some chose co-op students from two-year rather than four-

[24] The other local labor markets we examined included Fresno, Sacramento, and the Silicon Valley/San Jose area (also analyzed by Useem, 1986). Of course, this was not a census of local labor markets, so there may be others with close working relationships between employers and education providers. However, the weak ties between the two are structural, rooted in the differences between the kinds of institutions that firms are and the characteristics of educational institutions. It, therefore, requires substantial effort—of the kind that co-op programs represent—to bridge this gap.

year programs for this reason. Employers also mentioned the local angle of working with local programs out of loyalty to the institutions:

> We try to stay local if we can because of our allegiance to UC. In fact, a lot of our model shop employees are all graduates of UC and CTC. So we try to keep our loyalties here.

A second characteristic of sub-baccalaureate labor markets is that virtually all employers look for experience when hiring—particularly for highly job-specific experience. Much more than formal schooling, experience is an indicator of the skills which employers value: mastery of specific machines, production processes, or office procedures; motivation and persistence; and the ability to work with others. Over and over again, employers we interviewed insisted on the importance of experience over formal education—even for relatively low-level positions like accounting clerks. The human resource manager for a moderate-sized tool and die company described their hiring in the following way:

> When people come out of [the local community college and area vocational schools], they still truly have [only] the basics. We would consider that to be entry-level, between $6.00 and $7.50 an hour. That is what we would normally pay someone that was just coming out of a vocational school or out of [the local community college] with little or no experience. Because truly in those areas, the experience is really the key. You can't truly learn everything there is to know in the classroom in order to excel and climb up the ladder.

Even where there is some recognition of the value of schooling, there remains some ambivalence about formal education—linked to the need for highly specific skills which are too narrow to find in any educational institution. For example, the personnel manager of a firm that produces box-forming machines reported,

> I have specifically told [the engineering manager] that I do not want anyone any longer whom we have to train. I want somebody who has some background and work experience if possible. You can have a super education, [but] if they don't have anything in our line of products, it's worthless. It's start from square one.

In most firms, therefore, it is difficult to compensate for a lack of experience with sub-baccalaureate credentials. The strong preference for individuals with experience creates a problem for new entrants into the sub-baccalaureate labor market: If every employer requires experience, it becomes difficult to enter the labor market and accumulate this

experience. As one employer acknowledged, "My feeling is that entry level is tough: They really don't have any place to go unless there's a tremendous shortage."

However, the problem of young students and new entrants to the sub-baccalaureate labor market lacking experience is automatically solved with co-op programs. By definition, students have some relatively stable employment, with a single employer over a two-year period, by the time they complete a program. A personnel manager for a prominent machine-tool company described the advantage to both the student and the firm:

> [Co-op students] have at least some experience and they know the application of what they're learning. . . . Once they graduate, we have a tendency to hire those people. So then, when they're competing [with other applicants], they're competing with other people who have two-year or college degrees, but they have some hands-on experience in the company.

The providers of education in the Cincinnati area were equally aware of the importance of experience. As one co-op coordinator acknowledged,

> The most important thing is that because it is a two-year school, that two years of education really just gets them started educationally on a career. And a lot of employers wouldn't be able to capitalize on just that education if the students hadn't had some hands-on experience besides the labs. We've got about a 60/40 mix of lab and theory, in favor of theory by the way. And so the lab work is not enough to make a typical student credible on the job market. So cooperative education experience definitely helps.

Another advantage to experience as a hiring standard is that it help employers screen potential employees for certain behavioral capacities like motivation and persistence—capacities that are not well-measured by formal schooling. But like experience, co-op allows the firm to observe the individual and to learn about the personal capacities—motivation, diligence, interpersonal skills, and the like—that are so crucial to employment. As the director of technology transfer for a technical institute mentioned,

> First of all, it's a screening test for them to see, "Do I even want to hire this guy?" I know their work ethic; I know their work habits.

Another personnel director commented,

> At least half of [my company's] motivation [for participating in the co-op program] is to have these people whom we've been able to watch, we've been able to train—and upon their graduation we've got full-time employees.

Thus, co-op provides information about students that formal schooling does not—a particular advantage in the sub-baccalaureate labor market because of the use of experience as a hiring standard and the importance of personal characteristics that are best observed on the job.

CONCLUSIONS: THE IMPLICATIONS OF CINCINNATI FOR SCHOOL-TO-WORK

In many ways, the unique case of Cincinnati confirms what the partisans of cooperative education—and the more recent advocates of school-to-work programs—have always claimed. While definitive data remains elusive, the reports of employers and educators alike confirm a variety of benefits to students, including a smoother transition between school and work; the ability to accumulate a variety of work-related skills that are different from and complementary to those one learns in school; and better information about the jobs available and their suitability (or unsuitability). The benefits to educational institutions, particularly in reducing the gulf that appears to exist in other local markets between employers and educational institutions, are substantial as well. And in Cincinnati, the issue that bedevils many fledgling school-to-work programs—the problem of persuading employers about the value of providing work-based placements and getting them to offer sufficient places—simply doesn't exist. Employers are almost uniformly convinced about the value of co-op, particularly as a form of "growing your own" employees but also as a recruitment device and a source of productive, short-term labor.

However, the real value of examining co-op programs in Cincinnati is not to learn once again about the benefits of co-op and work-based approaches, but to understand the special conditions that have contributed to an enduring and widespread set of programs in Cincinnati, as well as the problems that remain despite the prevalence of co-op. To be sure, the applications of the Cincinnati experience—which is one dominated by *postsecondary* institutions—to school-to-work programs that have emphasized *secondary* schools is somewhat difficult. Many efforts in high schools—for example in short-term job shadowing and internships—are likely to be less intensive than full-blown co-op placements, and high school students are obviously less well-prepared and therefore less suitable as well-qualified workers than are postsecondary students. But the high school programs that intend to move students into substantial forms of work-based learning will

encounter all the problems that any postsecondary programs faces, including the recruitment of employers, the selection of students, the maintenance of some consistency between school-based and work-based components, and quality assurance. The levels of the educational system may differ, but the issues are relatively constant.

Even if the conditions that have fostered co-op education in Cincinnati are unique, there are at least three implications for school-to-work programs from examining Cincinnati programs:

1. *The support of employers.* Employers in Cincinnati support co-op wholeheartedly, both in the sense of providing placements and other forms of financial help to colleges and in the moral support they provide for close working relationships with education providers. In a community where the value of work-based education has come to be understood, there is little need for repeatedly making the case and persuading employers of their duty to participate—since self-interest rather than duty is the principal incentive.

   At the same time, two problems remain. One is that, roughly speaking, employers participate for either of two very different reasons. Those who are trying to "grow their own" employees in a school-based and work-based education program tailored to their particular requirements, are typically larger firms, able to rotate co-op students around different placements, and generous with supportive services like internal seminars so that students can learn about "all phases of the business"; they consistently articulate an educational motive—of wanting to educate students broadly and deeply. These programs also tend to use the alternating model, and are almost surely the best placements. But other firms—typically smaller, probably less profitable—view co-op as a source of relatively well-trained, well-screened (by the college) short-term labor;[25] in these cases, students tend not to rotate among a number of placements, there tend to be fewer supportive services, and the firm rather than the student is the principal beneficiary. Additionally, the dominant model is the parallel approach, one that can be very similar to much more informal work experience programs, or even casual afternoon employment. Co-op

[25] A difficult question that merits further examination is whether employers sometimes use co-op students as an alternative to permanent employees—much as they are now moving to temporary or contingent labor as a way of avoiding paying benefits and hiring and firing over the business cycle. None of the employers or educators mentioned this possibility, however.

coordinators claim that there are benefits to both kinds of co-op programs, and the value of experience in the sub-baccalaureate labor market cannot be underestimated. However, the value to students of placements justified as productive labor is more questionable because the motives of employers are not as clearly educational.[26] For school-to-work programs, it is important to recognize the division in motives and structure, and to encourage as much as possible the "grow your own" approach to work-based education.

In addition, finding enough co-op placements remains a struggle, even in Cincinnati. The difficulties in amassing enough placements for all students as the term approaches, in getting placements in small firms (which dominate some labor markets), and in finding placements in cyclical downturns when firms are laying off workers were cited by a number of co-op coordinators. Colleges have tried many tactics to avoid these problems, especially the attempt to develop "portfolios" of many employers of varying sizes and in different sectors so they are less vulnerable to cyclical declines in one sector, or the fortunes of a particular large company. But even in a community where work-based education has become widespread and where employers participate willingly, there is always excess demands for placements.

2. *The "high-quality equilibrium."* The quality of the co-op programs in Cincinnati is important to their persistence. Colleges screen their students so that they send only those who are academically well-prepared and committed to their postsecondary education; in addition, they often screen on behalf of employers for motivation, persistence, and other personal qualities. For their part, employers try to provide placements of high quality, knowing that the applicant pool will dwindle if placements are routine and unrewarding; and most have their own screening mechanisms, particularly for the personal qualities—eagerness and enthusiasm, the ability to work with others, dependability and stability, and well-roundedness—that they value more than either grades or specific technical skills. The maintenance of high quality by both educators and employers has prevented the Cincinnati programs from falling into a "low-quality equilibrium," as has happened to other

[26] An obvious but difficult research task would be to ascertain the long-run employment benefits of these two types of co-op or school-to-work programs—assuming that the two could be differentiated in the first place.

work experience and job training programs. A high-quality equilibrium is also an antidote to the negative perceptions of program quality that the U.S. General Accounting Office (1991) identified as a barrier to school-to-work programs.[27]

In Cincinnati, the high-quality equilibrium has been established not through skill standards, certificates of mastery, complex agreements with employers, or other similar accountability mechanisms.[28] Instead, clear expectations on the part of employers and educators alike, established in face-to-face contact and constant discussion between co-op coordinators and employer representatives (often from personnel or human resource departments), appear to be the most common mechanisms of establishing and enforcing the high-quality equilibrium. Indeed, it is tempting to argue that these personal connections are crucial to the close working relationships between educators and employers that distinguish the Cincinnati labor market from others: It may be that impersonal and bureaucratic forms of control like skill standards actually *impede* close working relationships. For school-to-work programs, these findings suggest that the rhetoric around skill standards should be moderated, since they may not accomplish what their advocates claim. However, efforts to develop "high-quality equilibria" in fledgling programs should continue, particularly by establishing close working relationships between education providers and employers.

The flip side of the "high-quality equilibrium" is, at least potentially, the issue of equitable access. The screening measures used in establishing programs of high quality have been designed to eliminate individuals with deficiencies in basic academic skills; with poor academic performance; with casual or part-time attendance and low commitment to postsecondary education; and with poor attitudes, persistence, and motivation. Almost inevitably, these screens must have eliminated many of the nontraditional students who enter community colleges, including those with mediocre academic records and "experimenters" unsure of their goals in postsecondary education—though all of the colleges developed

[27] While the GAO report concentrated on high school programs, these barriers are discussed in the literature on college co-op as well (Harsher et al., 1987).

[28] In asking employers about what state and federal policies could advance work-based education, we consistently probed about the value of skill standards. While it is impossible to prove that such mechanisms would not be useful from the responses of individuals who don't use them, the lack of support for skill standards and certificates of mastery (or other credentials aside from the associate degree) was uniform and striking.

various remedial or "pre-tech" programs to allow such students to overcome such problems. But these efforts all took place *prior* to enrollment in co-op because the high-quality equilibrium will fall apart if the performance of students on the job is deficient.

This finding suggests that school-to-work programs should provide any remediation necessary, affirmative action recruitment to enroll more minority students, or sex equity efforts to get more women into traditionally-male occupations, within the school-based component prior to work-based placement—and should also use the benefits of work-based placements as a motivation to get lackadaisical or uncommitted students to change their ways. But to apply remedial efforts or affirmative action at the stage when students are already on the job will inevitably erode the support of employers, and undermine the high-quality equilibrium.

3. *Institutionalizing support for work-based education.* The Cincinnati co-op programs have persisted without any obvious bureaucratic mechanism to keep them going: there is no central clearinghouse, or Chamber of Commerce office, or state-funded bureau in charge of co-ops.[29] Instead, their persistence seems to be due to three interrelated factors. First, the state of Ohio supports co-op through its regular program of state aid to community colleges, since students during their work placements are still counted as enrolled. This steady financial support—obtained through regular funding channels, not through special-purpose state or federal grants that are subject to the whims of funding cycles and appropriations, as federal school-to-work funds will be—has been critical to the stability of co-op programs, and it is clear that the cessation of state funding would end these programs as well. Second, the co-op coordinators in community colleges, funded through state aid, are absolutely crucial in every way: they recruit employers, maintain as much continuity as possible over time, screen students, establish links with faculty, promote co-ops within their own institutions, and generally provide the institutional

[29] The lack of any visible form of institutionalization was one of the most surprising aspects of Cincinnati's co-op programs. We asked persistently about mechanisms of institutional or bureaucratic control at a level larger than any one college or company, but were unable to find any.

"glue" that holds co-op programs together.[30] Third, within educational institutions, the fact that co-ops are required (in OCAS and CTC) and widespread (in Sinclair, where co-ops are voluntary) means that they are accepted among students as routine; even better, students have come to understand the additional benefits of work-based education, so that there is no need to recruit reluctant students. Finally, the employer community seems to rely on the history of co-op—since many managers and workers were themselves co-op students—and general acceptance of the benefits of co-ops, a culture which is spread around employers quite informally.

For those individuals (like us) who expect to see innovative practices institutionalized through bureaucratic authority and enforcement mechanisms like skill standards, the lack of such practices in Cincinnati is a genuine puzzle. However, a different interpretation is that—in sharp contrast to the common German practice, which is to wrap all practices in layers of bureaucratic mandates and institutional requirements—one might interpret the Cincinnati experience as a particularly American form of work-based education, embedded in voluntary relationships without rules and regulations.[31] The implications for fledgling school-to-work programs are not especially clear, unfortunately, since innovations almost surely require more support than do ongoing practices, and the efforts to develop high-quality school-to-work programs may require some external pressures to prevent low-quality programs from developing. But the Cincinnati experience clarifies, we think, that an informal culture of expectations around work-based learning may be more powerful in the long run than special funding subject to political whims and bureaucratic requirements resisted by the American preference for *laissez faire*.

One special threat to co-op programs, which arose during our visits, illustrates both the importance and the fragility of cultural norms. The Board of Trustees at Cincinnati

[30] However, they appear to work independently of one another; that is, there is no regional organization of co-op coordinators or those committed to co-op education, to share practices or promote co-op in a wider sense.

[31] Indeed, it may be that even the rule-bound German system is more dependent on unstated cultural norms than most of us realized. As David Finegold (1995) concluded about the German model, "It is not possible to transplant this system—which evolved from the medieval craft guilds, and thus grounded in a long tradition of respect and reward for skilled, manual careers—without the deep structural and cultural roots that support it" (p. 5).

Technical College voted in August 1993 to become a comprehensive community college.[32] Co-op coordinators at CTC feared that this "academic" emphasis might undermine co-op, as resources could be diverted to transfer centers, articulation mechanisms, honors academic programs, and other transfer-oriented practices, and as the purpose of preparing for substantial employment was displaced by the common goal of entering a four-year college and (presumably) getting a baccalaureate degree. The particular outcome at CTC is less important than the general warning: In an educational "system" in which there is a clearly defined hierarchy, with academic programs and the baccalaureate at (or near) the top, school-to-work programs may be seen as second-class programs and undermined by a lack of commitment to efforts combining school-based and work-based learning.

But this observation returns us to our starting point—the ambiguity about whether preparation for employment should best be carried out in educational institutions, at work, or through a combination of both. The threat of the pressure for a greater emphasis on transfer and on "academic" education is one of several forces that has persistently undermined occupationally oriented schooling and work-based education. The vision and promise of school-to-work programs are that a combination is more powerful than either component alone. The greatest lesson of the Cincinnati experience is that this vision can be achieved under the right conditions—the commitment to occupational preparation by educational institutions; a stable funding source, particularly for co-op coordinators; a parallel commitment by employers, particularly when they appreciate the educational value of work placements in "grow your own" programs; a high-quality equilibrium sustained by the commitment of each side to high quality; and a consistency between the school- and work-based components created by constant interaction between educators and employers. Under these conditions, a uniquely American form of school-to-work programs has evolved in Cincinnati—and by implication can develop elsewhere.

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[32] In postsecondary institutions, there has been a constant process of "institutional drift" in which area vocational schools initially devoted to secondary and postsecondary students, evolve into technical institutes offering certificate and associate degrees, and then become comprehensive community colleges by adding academic degrees. The most recent stage in this "drift" is the attempt by some community colleges to become baccalaureate-granting institutions by grafting another two years onto their programs. "Institutional drift" is testimony to the status of academic over vocational goals and of the baccalaureate degree over sub-baccalaureate credentials.

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APPENDIX

Interview Guide – Employer

1. Please describe the cooperative education programs at your company.
2. Please describe the selection process for students entering co-op programs and some general characteristics of the types of students who go into co-op.
3. How prevalent are co-op programs at this company?
4. Please describe the resources used to increase or maintain co-op at your institution.
5. Please describe the nature of the relationship between school-based and work-based components in the co-op programs.
6. What are the primary benefits of cooperative education for students?
7. What are the primary benefits of cooperative education for employers?
8. What are the primary benefits of cooperative education for education providers?
9. How is cooperative education evaluated?
10. How might co-op be expanded into more educational institutions or companies?

Interview Guide – Education Provider

1. Please describe the cooperative education programs at your institution.
2. Please describe the selection process for students entering co-op programs and some general characteristics of the types of students who go into co-op.
3. How prevalent are co-op programs at this college?
4. Please describe the resources used to increase or maintain co-op at your institution.
5. Please describe the nature of the relationship between school-based and work-based components in the co-op programs.

6. What are the primary benefits of cooperative education for students?

7. What are the primary benefits of cooperative education for employers?

8. What are the primary benefits of cooperative education for education providers?

9. How is cooperative education evaluated?

10. How might co-op be expanded into more educational institutions or companies?